APPENDIX D

NOISE AND VIBRATION REPORT

COYOTE VALLEY SPECIFIC PLAN NOISE STUDY REPORT SAN JOSE, CALIFORNIA

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INTRODUCTION

This report presents the results of the environmental noise impact assessment of the Coyote Valley Specific Plan (CVSP) project in San Jose, California. The development area of the CVSP would ultimately be a community of up to approximately 70,000 to 80,000 residents, and the Plan includes uses such as workplace, residential, retail, and mixed use development, structured/shared parking, new roadways, including a main multi-functional parkway and an extension of Bailey Avenue to the southwest towards the Almaden Valley, an internal transit system with a connection to a proposed multi-modal transit station on the west side of the existing Caltrain line, a lake, the relocated and restored Fisher Creek, an urban canal, libraries, schools, services and utilities, parks, trails, and playfields. The Coyote Valley Greenbelt (between Palm Avenue and Morgan Hill and on the east side of Coyote Creek, extending to US 101 between Metcalf Road and Morgan Hill) will remain as a permanent non-urban buffer between San José and Morgan Hill. The report assesses the noise impacts resulting from the project's alternatives and presents mitigation measures to reduce significant noise impacts to less than significant levels.

The Setting section of the report presents a discussion of the fundamentals of environmental acoustics to assist those unfamiliar with acoustical terminology. A description of state regulations and local guidelines is then presented to establish the regulatory criteria applicable in the noise impact assessment. The results of the noise monitoring survey are then summarized. The Impact and Mitigation Measures section identifies project impacts, including noise and land use compatibility of the proposed uses, compatibility with groundborne vibration, and substantial permanent or temporary noise level increases in the project vicinity that would occur as a result of the project. Where future noise levels exceed the applicable significance thresholds, a significant noise impact is identified. Recommendations are then presented for incorporation into the design of the project to achieve a compatible development with respect to the noise environment and surrounding land uses.

SETTING

Fundamentals of Environmental Acoustics

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its loudness. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. *Loudness* is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in a particular location. *A decibel (dB)* is a unit of measurement which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table 1.

There are several methods of characterizing sound. The most common in California is the *A-weighted sound level or dBA.* This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 2. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called L_{eq}. The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level, CNEL,* is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 pm - 10:00 pm) and a 10 dB addition to nocturnal (10:00 pm - 7:00 am) noise levels. The *Day/Night Average Sound Level, L_{dn},* is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

TABLE 1 Definitions of Acoustical Terms Used in this Report

Term	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, Leq	The average A-weighted noise level during the measurement period. The hourly Leq used for this report is denoted as dBA $L_{eq[h]}$.
Day-Night Level, L_{dn}	L_{dn} is the equivalent noise level for a continuous 24-hour period with a 10-decibel penalty imposed during nighttime and morning hours (10:00 pm to 7:00 am).
Community Noise Exposure Level, CNEL	CNEL is the equivalent noise level for a continuous 24-hour period with a 5-decibel penalty imposed in the evening (7:00 pm to 10:00 pm) and a 10-decibel penalty imposed during nighttime and morning hours (10:00 pm to 7:00am)
L_1, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

TABLE 2 Typical Noise Levels in the Environment

Common Outdoor Noise Source	Noise Level (dBA)	Common Indoor Noise Source
	120 dBA	
Jet fly-over at 300 meters		Rock concert
	110 dBA	
Pile driver at 20 meters	100 dBA	
		Night club with live music
	90 dBA	
Large truck pass by at 15 meters		
	80 dBA	Noisy restaurant
		Garbage disposal at 1 meter
Gas lawn mower at 30 meters	70 dBA	Vacuum cleaner at 3 meters
Commercial/Urban area daytime		Normal speech at 1 meter
Suburban expressway at 90 meters	60 dBA	
Suburban daytime		Active office environment
	50 dBA	
Urban area nighttime		Quiet office environment
	40 dBA	
Suburban nighttime		
Quiet rural areas	30 dBA	Library
		Quiet bedroom at night
Wilderness area	20 dBA	Quiet recording studio
	10 dBA	
Threshold of human hearing		Threshold of human hearing
	0 dBA	

Fundamentals of Groundborne Vibration

Railroad operations are potential sources of substantial ground vibration depending on distance, the type and the speed of trains, and the type of railroad track. People's response to ground vibration has been correlated best with the velocity of the ground. The velocity of the ground is expressed on the decibel scale. The reference velocity is 1 x 10^{-6} in./sec. RMS, which equals 0 VdB, and 1 in./sec. equals 120 VdB. Although not a universally accepted notation, the abbreviation "VdB" is used in this document for vibration levels to reduce the potential for confusion with sound levels.

Typical background vibration levels in residential areas are usually 50 VdB or lower, well below the threshold of perception for most humans. Perceptible vibration levels inside residences are attributed to the operation of heating and air conditioning systems, door slams and foot traffic. Construction activities, train operations, and street traffic are some of the most common external sources of vibration that can be perceptible inside residences. Table 3 illustrates some common sources of vibration and the association to human perception or the potential for structural damage.

One of the problems with developing suitable criteria for groundborne vibration is the limited research into human response to vibration and more importantly human annoyance inside buildings. However, experience with rapid transit systems over the last few decades has developed rational vibration limits that can be used to evaluate human annoyance to groundborne vibration. These criteria are primarily based on experience with passenger train operations, such as rapid transit and commuter rail systems. The main difference between passenger and freight operations is the time duration of individual events; a passenger train lasts a few seconds whereas a long freight train may last several minutes, depending on speed and length. Although these criteria are based on shorter duration events reflected by passenger trains, they are also used in this assessment to evaluate the potential of vibration-induced annoyance on the site due to large freight trains and passenger trains.

TABLE 3 Typical Levels of Groundborne Vibration

Human/Structural Response	Velocity Level, VdB (re 1µinch/sec, RMS)	Typical Events (50 –foot setback)
Threshold, minor cosmetic damage	100	Blasting, pile driving, vibratory compaction equipment
		Heavy tracked vehicles (Bulldozers, cranes, drill rigs)
Difficulty with tasks such as reading a video or computer screen	90	
		Commuter rail, upper range
Residential annoyance, infrequent events	80	Rapid transit, upper range
Residential annoyance, frequent events		Commuter rail, typical Bus or truck over bump or on rough roads
	70	Rapid transit, typical
Approximate human threshold of perception to vibration		Buses, trucks and heavy street traffic
	60	
		Background vibration in residential settings in the absence of activity
Lower limit for equipment ultra-sensitive to vibration	50	

Source: Illingworth & Rodkin, Inc. and U.S. Department of Transportation, Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006,FTA-VA-90-1003-06.

Regulatory Background - Noise

The State of California, the Santa Clara County Airport Land Use Commission (ALUC), and the City of San Jose establish guidelines, regulations, and policies designed to limit noise exposure at noise sensitive land uses. Appendix G of the State CEQA Guidelines, the State of California Building Code, the Santa Clara County Airport Land Use Plan, and the City of San Jose's 2020 Plan present the following:

State CEQA Guidelines. The California Environmental Quality Act (CEQA) contains guidelines to evaluate the significance of effects of environmental noise attributable to a proposed project. CEQA asks whether the proposed project would result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or Noise Ordinance, or applicable standards of other agencies?
- Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

CEQA does not define what noise level increase would be considered substantial. Typically, project-generated noise level increases of 3 dBA DNL or greater would be considered significant where exterior noise levels would exceed the normally acceptable noise level standard (60 dBA DNL). Where noise levels would remain below the normally acceptable noise level standard, noise level increases of 5 dBA DNL or greater would be considered significant.

Section 1208 of the 2001 California Building Code. New multi-family housing in the State of California is subject to the environmental noise limits set forth in Appendix Chapter 1208A.8.2 of the California Building Code. The noise limit is a maximum interior noise level of 45 dBA DNL. Where exterior noise levels exceed 60 dBA DNL, a report must be submitted with the building plans describing the noise control measures that have been incorporated into the design of the project to meet the noise limit.

City of San Jose General Plan. The Noise Element of the City of San Jose's 2020 Plan identifies noise and land use compatibility standards for various land uses. The City's goal is to, "...minimize the impact of noise on people through noise reduction and suppression techniques, and through appropriate land use policies."

Residential land uses are considered "satisfactory" up to 60 dBA DNL as the short-range exterior noise quality level, and 55 dBA DNL as the long-range exterior noise quality level. The guidelines state that where the exterior DNL is above the "satisfactory" limit (between 60 and 70 dBA DNL), and the project requires a full EIR, an acoustical analysis should be made indicating the amount of attenuation necessary to maintain an indoor level of less than or equal to 45 dBA DNL (consistent with the State Building Code). When noise levels would exceed 70 dBA DNL, residential development would only be permitted if uses are entirely indoors and the building design limits interior levels to less than or equal to 45 dBA DNL. Outside activity areas should be permitted if site planning and noise barriers result in levels of 60 dBA DNL or less.

Policy 1. The City's acceptable noise level objectives are 55 dBA DNL as the long-range exterior noise quality level, 60 dBA DNL as the short-range exterior noise quality level, 45 dBA DNL as the interior noise quality level, and 76 dBA DNL as the maximum exterior noise level necessary to avoid significant adverse health effects. These objectives are established for the City, recognizing that the attainment of exterior noise quality levels in the environs of the San Jose International Airport, the Downtown Core Area, and along major roadways may not be achieved in the time frame of this Plan. To achieve the noise objectives, the City should require appropriate site and building design, building construction and noise attenuation techniques in new residential development.

Policy 9. Construction operations should use available noise suppression devices and techniques.

Policy 11. When located adjacent to existing or planned noise sensitive residential and public/quasi-public land uses, non-residential land uses should mitigate noise generation to meet the 55 dBA DNL guideline at the property line.

Policy 12. Noise studies should be required for land use proposals where known or suspected peak event noise sources occur which may impact adjacent existing or planned land uses.

The General Plan sets forth the following urban design policies regarding sound attenuation along city streets:

Policy 18. To the extent feasible, sound attenuation for development along city streets should be accomplished through the use of landscaping, setback, and building design rather than the use of sound attenuation walls. Where sound attenuation walls are deemed necessary, landscaping and an aesthetically pleasing design shall be used to minimize visual impact.

Policy 21. To promote safety and to minimize noise impacts in residential and working environments, development which is proposed adjacent to railroad lines should be designed to provide the maximum separation between the rail line and dwelling units, yards or common open space areas, offices, and other job locations, facilities for the storage of toxic or explosive materials and the like. To the extent possible, areas of development closest to an adjacent railroad line should be devoted to parking lots, public streets, peripheral landscaping, the storage of non-hazardous materials, and so forth.

City of San Jose Zoning Ordinance. The City of San Jose has adopted noise standards for the installation of new backup power generators. The maximum allowable noise level at the closest property line in a residential area is 55 dBA L_{eq}. Additionally, the City requires non-residential land uses to mitigate noise generation to meet the 55 dBA DNL guideline at the property line.

Regulatory Background - Vibration

The City of San Jose has not identified quantifiable vibration limits that can be used to evaluate the compatibility of land uses with the expected vibration environment. Although there are no local standards that control the allowable vibration in a new residential development, the U.S. Department of Transportation's Federal Transit Administration (FTA) has developed vibration impact assessment criteria for evaluating vibration impacts associated with transit projects.[1] FTA has proposed vibration impact criteria, based on maximum overall levels for a single event. The impact criteria for groundborne vibration are shown in Table 4. Note that there are criteria for frequent events (more than 70 events of the same source per day), occasional events (30 to 70 vibration events of the same source per day), and infrequent events (less than 30 vibration events of the same source per day).

[1]U.S. Department of Transportation, Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006, FTA-VA-90-1003-06.

TABLE 4 Groundborne Vibration Impact Criteria

Land Use Category	Groundborne Vibration Impact Levels (VdB re 1 µinch/sec, RMS)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1 Buildings where vibration would interfere with interior operations.	65 VdB[4]	65 VdB[4]	65 VdB[4]
Category 2 Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB
Category 3 Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB

Notes:

1. "Frequent Events" is defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.
2. "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations.
3. "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.
4. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration sensitive manufacturing or research should always require detailed evaluation to define the acceptable vibration levels. Ensuring low vibration levels in a building requires special design of HVAC systems and stiffened floors.

Source: U.S. Department of Transportation, Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006, FTA-VA-90-1003-06.

Existing Noise Environment

The Coyote Valley Specific Plan Area is located south of the City of San Jose within the City's Sphere of Influence. The Plan Area is bounded by the Santa Teresa area of southern San Jose to the north, US 101 to the east, the City of Morgan Hill to the south, and the Santa Cruz mountains to the west.

The existing noise environment in and around the Plan Area varies, but is predominantly the result of local transportation noise sources such as US 101, Monterey Road, and other local roadways and the Union Pacific Railroad. A survey of the existing noise environment was made during July 2005. The noise monitoring survey included eight long-term noise measurements (24-hours or more duration) and 4 short-term noise measurements. Long-term noise measurements documented the daily trend in noise levels generated by area roadways. Short-term noise monitoring locations were selected to quantify noise levels from a variety of noise sources identified in the field. The DNL was measured directly at the long-term sites and estimated at the short-term sites by correlation with a nearby long-term measurement. Noise measurement locations are shown on Figure 1.

One noise measurement was made near existing receivers along McKean Road that could potentially be affected by the McKean Road to Almaden Expressway project. Noise measurement LT-1 documented the daily trend in noise levels generated by vehicular traffic along McKean Road at receivers located northwest of the CVSP Plan Area.

Noise measurements LT-2 through LT-8 documented noise levels in the CVSP Plan Area. Noise measurement LT-2 quantified the daily trend in noise levels along Bailey Road west of Santa Teresa Boulevard. Long-term noise measurement LT-3 documented existing ambient noise levels along Bailey Road east of Santa Teresa Boulevard. Noise measurements LT-4 and LT-5 quantified existing traffic noise levels along Santa Teresa Boulevard north and south of Bailey Avenue, respectively. The long-term noise measurement made at Site LT-6 documented noise levels generated by vehicular traffic along Palm Avenue between Dougherty Avenue and Santa Teresa Boulevard. Noise measurement location LT-7 was selected to represent ambient noise levels at the easternmost portion of the project area nearest US 101. Noise levels generated by vehicular traffic and railroad trains along the Monterey Road corridor were documented at site LT-8.

Data gathered at these locations are summarized in Table 5. A graphical summary of the data gathered at each of the long-term measurement sites is included in Appendix A. Table 6 presents the results of short-term noise measurements conducted in the CVSP Area. Table 7 presents existing contour distances for area roadways.

FIGURE 1 Noise and Vibration Measurement Locations

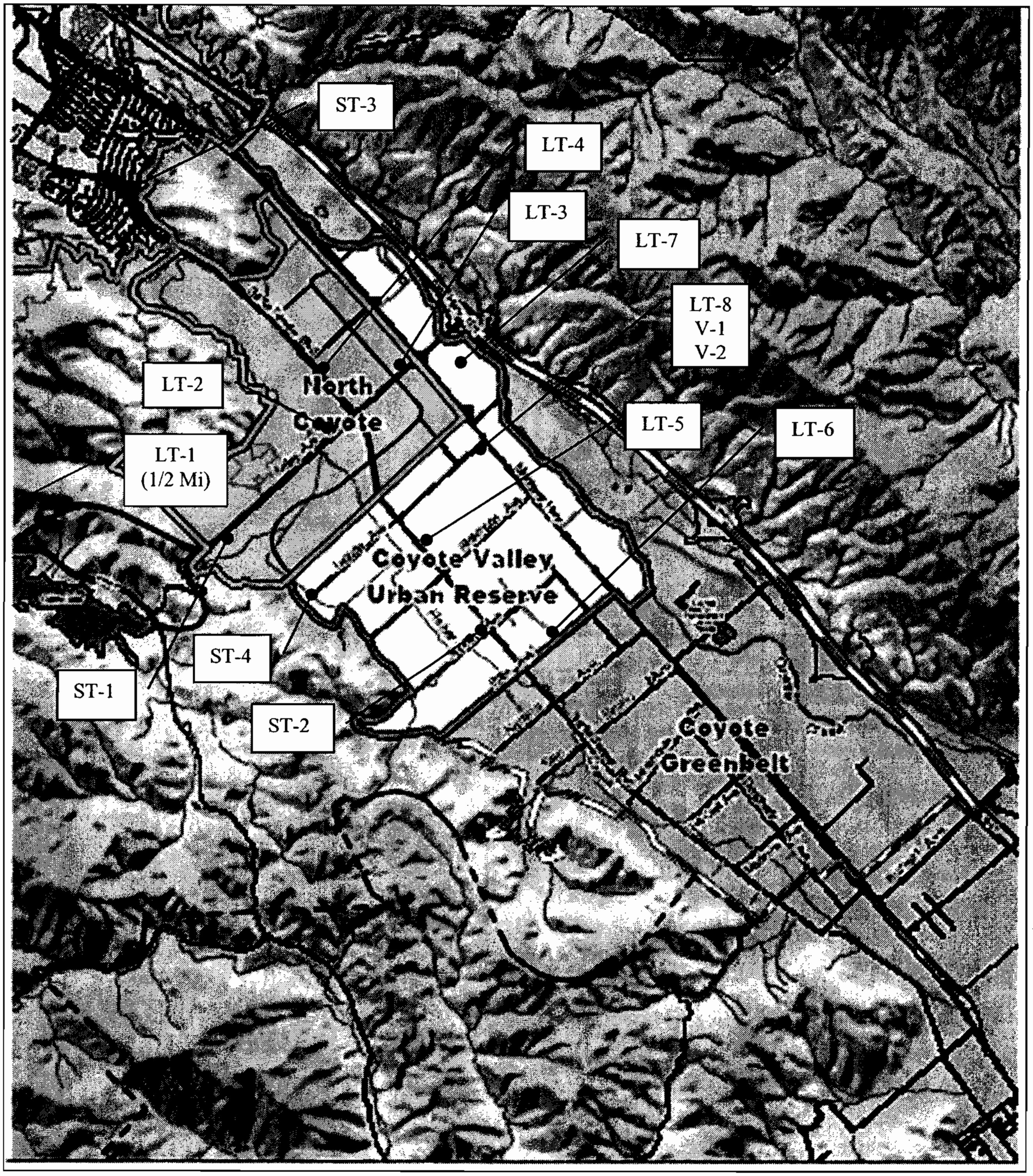

TABLE 5 Long Term Noise Measurement Summary

	Noise Level (dBA)		
Noise Measurement Location (Date/Time)	**Range of Daytime $L_{eq's}$**	**Range of Nighttime $L_{eq's}$**	**Existing DNL**
LT-1 - 65 feet from the Center of McKean Road. (July 6-7, 2005 / 12:00 to 12:00)	61-67	47-64	66
LT-2 - 90 feet from the Centerline of Bailey Road west of Santa Teresa Boulevard. (July 6-7, 2005 / 13:00 to 13:00)	59-68	51-64	66
LT-3 - 80 feet from the Centerline of Bailey Road east of Santa Teresa Boulevard. (July 6-7, 2005 / 13:00 to 13:00)	61-66	53-64	66
LT-4 - 100 feet from the Center of Santa Teresa Boulevard north of Bailey Road. (July 12-14, 2005 / 13:00 to 13:00)	63-69	52-68	68-69
LT-5 - 20 feet from the Center of Santa Teresa Boulevard south of Bailey Road. (July 12-14, 2005 / 13:00 to 13:00)	67-72	54-71	72-73
LT-6 - 65 feet from the Center of Palm Avenue east of Santa Teresa Boulevard. (July 12-14, 2005 / 13:00 to 13:00)	58-66	53-63	66
LT-7 - ~1400 feet from US 101. (January 19 - 20, 2006)	57-63	51-62	63
LT-8 - 300 feet from the Centerline of Monterey Road and ~215 feet from the UPRR. (December 6-8, 2005 / 15:00 to 11:00)	54-68	52-67	68-69

TABLE 6 Short Term Noise Measurement Summary

	Noise Level (dBA)					
Noise Measurement Location (Date/Time)	L_{eq}	L_{max}	L_{10}	L_{50}	L_{90}	**DNL (Est.)**
ST-1 - 50 feet from the Centerline of Bailey Road east of IBM Campus. (July 6, 2005 / 13:30 to 13:40)	62	75	67	49	42	65
ST-2 – 70 feet from the Centerline of Santa Teresa Boulevard south of Bailey Road. (July 14, 2005 / 12:00 to 12:10)	63	79	66	50	42	66
ST-3 – 80 feet from the Centerline of Santa Teresa Boulevard at Cheltenham Way. (July 14, 2005 / 12:20 to 12:30)	65	78	70	62	51	70
ST-4 – West end of Laguna Avenue. (July 14, 2005 / 12:40 to 12:50)	40	49	43	39	35	<55

TABLE 7 Existing Noise Contour Distances for Area Roadways

	Distance from Roadway Center (feet)		
Roadway Segment	**70 DNL**[2]	**65 DNL**	**60 DNL**
McKean Road north of Bailey Road	--	80	190
Bailey Road west of Santa Teresa Boulevard.	--	110	230
Bailey Road east of Santa Teresa Boulevard.	--	100	210
Santa Teresa Boulevard north of Bailey Road.	80	220	400
Santa Teresa Boulevard south of Bailey Road.	--	120	250
Palm Avenue east of Santa Teresa Boulevard.	--	80	190
US 101	480	1000	2200
Monterey Road	100	220	480

[2] Data not reported within 50 feet of the roadway center.

Existing Vibration Environment Along UPRR Corridor

Vibration measurements were made on Tuesday, December 6, 2005 near noise measurement location LT-8 at the easternmost terminus of Richmond Avenue. The instrumentation used to make the measurements included a Sony Digital Audio Tape Recorder (DAT) and seismic grade, low noise accelerometers firmly fixed to the ground. This system is capable of accurately measuring very low vibration levels. Vibration levels were measured at ground level and were representative of vibration levels that would enter a building's foundation.

Vibration measurements were taken at two setbacks from the Union Pacific Railroad line. Position V-1 was approximately 60 feet from the railroad track and Position V-2 was 120 feet from the railroad track. The two different setbacks were used to develop a drop-off rate for ground vibration with distance. Vibration levels were only measured in the vertical axis because ground vibration is typically most dominant on the vertical axis and the data are adequate in characterizing the exposure of the site to vibration from railroad trains.

Two southbound Caltrain passbys were measured on the evening of December 6, 2005. Through trains were observed to travel at speeds of approximately 50 mph. Vibration levels measured at each measurement position during train passby events are summarized in Table 8. Vibration levels ranged from approximately 79 to 80 VdB at a distance of 60 feet from the tracks and 75 to 76 VdB at 120 feet from the tracks.

TABLE 8 Results of Vibration Measurements

	Vibration Level (VdB re 1μinch/sec, RMS)		
Activity	Position V-1	Position V-2	Comments
SB Caltrain (6:40 p.m.)	80 VdB	76 VdB	50 mph
SB Caltrain (7:23 p.m.)	79 VdB	75 VdB	50 mph

Notes:

Position V-1 – 60 feet from the UPRR
Position V-2 - 120 feet from the UPRR

IMPACTS AND MITIGATION MEASURES

Significance Criteria

- A significant impact would be identified if noise-sensitive receivers proposed by the project would be exposed to noise levels exceeding the City's established guidelines for "satisfactory" noise and land use compatibility. Satisfactory exterior average noise levels are defined as 60 dBA DNL or less, and satisfactory interior average noise levels are defined as 45 dBA DNL or less. Maximum instantaneous noise levels within residential units generated by peak events (e.g., train warning whistles) shall be 50 dBA or less in bedrooms and 55 dBA or less in other rooms.

- A significant noise impact would be identified where public/quasi-public land uses and other non-residential land uses would generate noise levels greater than 55 dBA DNL guideline at the property line adjacent to residential uses.

- A significant impact would result if the project would locate vibration sensitive residential land uses in areas where vibration levels from freight trains or commuter trains exceeds 75 VdB for "occasional" vibration events (between 30 and 70 events of the same source per day). A significant impact would also result if the project would locate vibration sensitive buildings where vibration would interfere with interior operations.

- According to CEQA, a significant noise impact would result if noise levels increase substantially at existing noise-sensitive land uses (e.g., residences) as a result of the implementation of CVSP. A "substantial increase" would be an increase of 3 dBA DNL or greater at noise-sensitive land uses where noise levels already exceed 60 dBA DNL, or 5 dBA DNL or greater where the noise level would remain below 60 dBA DNL.

- Construction noise levels would be treated somewhat differently because they are temporary. Significant noise impacts would result from construction if noise levels are sufficiently high to interfere with speech, sleep, or normal residential activities. Construction-related hourly average noise levels received at noise-sensitive land uses exceeding 60 dBA $L_{eq(hr)}$, and at least 5 dBA above the ambient, would be considered significant if the noise-generating construction affected the noise environment at a sensitive receiver for more than 12 months.

- A significant noise impact would occur if the project located noise sensitive land uses where aircraft noise levels exceeded the applicable standards of the Santa Clara County ALUC.

Impact 1: Exposure of Persons to Excessive Noise Levels.
The proposed project would introduce noise-sensitive uses into noise environments that exceed the "satisfactory" level for new construction. **This is a potentially significant impact.**

Exterior Noise

Implementation of CVSP project would place noise-sensitive land uses including single- and multiple-family residences where noise levels exceed the City of San Jose noise and land use compatibility guidelines and the noise insulation standards contained in the California Building Code. Noise-sensitive land uses proposed within the plan area in the vicinity of US 101, arterial roadways, collector roadways, and the UPRR would be exposed to exterior noise levels greater than 60 dBA DNL, which exceeds the City of San Jose's short-term noise and land use compatibility goal for noise in private or shared outdoor activity areas.

Noise contour distances for area roadways were calculated with a traffic noise model based on build-out traffic volumes and preliminary design information for arterial and collector roadways. Vehicle-mix and speed assumptions were input into the traffic noise model to create a credible worst-case projection of noise levels within the plan area. These projections do not account for shielding provided by proposed structures or variations in topography relative to area roadways. The noise contour distances presented in Table 9 indicate where further detailed noise analyses would be required during project level review.

US 101 would continue to be the predominant noise source at the easternmost portion of the CVSP plan area. Future traffic volumes during the peak traffic hours are projected to exceed the highway's capacity resulting in periods of slow traffic. The loudest hours would not necessarily be the hours when travel demand is greatest, but rather the hours during which the maximum number of vehicles could flow at highway speed. A comparison of future constrained peak-hour traffic volumes to existing constrained peak-hour volumes indicates that US 101 traffic noise levels would increase by 1 to 2 dBA DNL in the future. US 101 would be expected to generate noise levels exceeding 70 dBA DNL within 650 feet of the roadway centerline, 65 dBA DNL within 1,400 feet of the roadway centerline, and 60 dBA DNL within approximately 3,000 feet of the roadway centerline.

Roadways that would generate day-night average noise levels greater than 70 dBA DNL at a distance of 100 feet from the centerline are primarily located in the easternmost portion of the plan area and include Monterey Road, Coyote Creek Road, and portions of Coyote Valley Parkway, Scheller Avenue, and Bailey Avenue, that are east of Coyote Creek Road. Santa Teresa Boulevard, north of Coyote Valley Parkway would also be expected to generate noise levels in excess of 70 dBA DNL at a distance of 100 feet from the roadway center. These roadways are generally designated as four- to six-lane arterial roadways in the conceptual circulation system.

Portions of the roadways including Santa Teresa Boulevard, Coyote Valley Parkway, Fisher Creek Drive, Scheller Avenue, Bailey Avenue, Sobrato Road, Palm Canyon, Lakeside Drive, Central Loop Road, 10th Street, and Industrial Parkway would be expected to generate noise levels ranging from about 65 dBA DNL to 70 dBA DNL at a distance of 100 feet from the centerline of the roadway. These roadways are generally designated as two-lane collectors or four-lane arterial roadways in the conceptual circulation system.

Two-lane collector roadways including portions of Santa Teresa Boulevard, Bailey Avenue, Lakeside Drive, Outer Lake Road, Central Loop Road, Silver Drive, West Central Boulevard, East Central Boulevard, and Coyote Drive would be expected to generate noise levels ranging from about 65 dBA DNL to 70 dBA DNL at a distance of 100 feet from the centerline of the roadway.

The number of railroad trains traveling along the UPRR corridor through the CVSP plan area may increase in the future as a result of additional commuter trains planned to and from Morgan Hill and Gilroy (Caltrain) and additional through freight trains and passenger trains (Amtrak). DNL noise levels would vary depending on the ultimate number of trains and timing of the passby events. Maximum noise levels during passby events would be expected to be similar to existing conditions. Railroad trains would be expected to generate maximum noise levels ranging from 90 to 100 dBA L_{max} at a distance of 100 feet from the railroad tracks. The existing 70 dBA DNL noise contour is located approximately 150 feet from the center of the tracks. The future noise environment along the railroad corridor may or may not increase given the uncertainties regarding the future number of trains and timing of passbys.

Where exterior noise levels exceed the City's noise level goal of 60 dBA DNL, mitigation is normally required to provide a compatible exterior noise environment. Achieving the City's noise level goal of 60 dBA DNL may not be possible in all situations, and a somewhat higher acceptability threshold is allowed by the City provided that noise levels in at least one of the outdoor use areas provided at a development is reduced to at least 65 dBA DNL. 65 dBA DNL is consistent with the residential land use guidelines of HUD and FAA[3]. Mitigation methods available to reduce exterior noise levels in private or shared outdoor use areas would include site planning alternatives (e.g., increased setbacks and using the proposed buildings as noise barriers), the construction of traditional noise barriers or earth berms, or a combination of the

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[3] U.S. Department of Housing and Urban Development, 24 CFR Part 51. U.S. Department of Transportation, Federal Aviation Administration, 14 CFR Part 150.

above. The final recommendations for mitigation would be determined on a project basis when detailed site plans and grading plans are available.

TABLE 9 - Future Noise Contour Distances from CVSP Roadways (Feet from road center)

ROADWAY	SEGMENT	70 dBA DNL [4]	65 dBA DNL	60 dBA DNL
US 101	Metcalf Road to Coyote Creek Golf Drive	650	1400	3020
Monterey Road	North of Coyote Valley Parkway	180	400	860
	South of Coyote Valley Parkway	180	400	860
	South of Bailey Avenue	180	400	860
	South of East Central Boulevard	180	400	860
	South of Scheller Ave/Coyote Creek Golf Drive	180	400	860
Coyote Creek Road	South of Coyote Valley Parkway	150	310	680
	South of Industrial Parkway	170	360	780
	South of Bailey Avenue	170	370	800
	South of East Central Boulevard	160	340	730
	South of Silver Drive	150	330	710
	South of Scheller Ave/Coyote Creek Golf Drive	110	240	510
	South of Coyote Drive	90	200	430
Santa Teresa Boulevard	North of Coyote Valley Parkway	120	250	540
	South of Coyote Valley Parkway	70	160	340
	South of Industrial Parkway	--	70	160
	South of Sobrato Road	90	180	400
	South of East Central Boulevard	90	190	410
	South of Scheller Ave/Coyote Creek Golf Drive	--	80	170
	South of Coyote Drive	--	60	140
Coyote Valley Parkway	East of Monterey Road	170	360	770
	East of Coyote Creek Road	190	410	880
	East Of Patane Way	80	170	360
	East of Santa Teresa Boulevard	60	120	260
	West of Santa Teresa Boulevard	80	170	380
	South of Industrial Parkway	90	200	440
	South of Bailey Avenue	90	190	410

[4] Data not reported within 50 feet of the roadway center.

TABLE 9 - Future Noise Contour Distances from CVSP Roadways (feet from center)

ROADWAY	SEGMENT	70 dBA DNL	65 dBA DNL	60 dBA DNL
Fisher Creek Drive	South of Sobrato Road	90	180	400
	South of West Central Boulevard	90	200	430
	South of East Central Boulevard	80	180	390
	East of Palm Canyon	80	180	390
Scheller Avenue	East of Santa Teresa Boulevard	80	170	360
	South of Silver Drive	80	170	360
	East of Coyote Creek Road	160	350	750
	East of Monterey Road	160	350	760
Bailey Avenue	West of Hillside Road	50	120	250
	East of Hillside Road	70	150	310
	East of Sobrato Road	60	130	280
	East of Santa Teresa Boulevard	--	50	120
	East of Lakeside Drive	--	70	150
	East of Central Loop Road	60	130	270
	East of Coyote Creek Road	220	470	1020
	East of Monterey Road	210	440	960
Sobrato Road	South of Bailey Avenue	70	150	330
	South of Fisher Creek Drive	70	150	330
Palm Canyon	South of Fisher Creek Drive	50	100	220
Lakeside Drive	East of Santa Teresa Boulevard	--	70	150
	South of Bailey Avenue	--	70	140
	South of 10th Street	80	180	390
Outer Lake Road	East of Santa Teresa Boulevard	--	80	180
	South of Bailey Avenue	--	90	180
Central Loop Road	East of Santa Teresa Boulevard	--	60	130
	South of Bailey Avenue	--	70	150
	South of 10th Street	50	120	250
	South of W. Central Boulevard	--	60	140
10th Street	East of Lakeside Drive	70	160	340
	East of Central Loop Road	60	130	280
Industrial Parkway	East of Santa Teresa Boulevard	80	170	360
Silver Drive	East of Scheller Avenue	--	80	160
West Central Boulevard	East of Fisher Creek Drive	--	60	140
	East of Santa Teresa Boulevard	--	60	140
East Central Boulevard	East of Fisher Creek Drive	--	60	140
	East of Santa Teresa Boulevard	--	50	110
Coyote Drive	East of Santa Teresa Boulevard	--	--	90

Interior Noise

Interior noise levels within new residential units shall not exceed 45 dBA DNL. In buildings of typical construction, with the windows partially open, interior noise levels are approximately 15 dBA lower than exterior noise levels. With the windows closed, standard residential construction typically provides 20 to 25 decibels of exterior to interior noise reduction.

In exterior noise environments of 60 dBA DNL or less, standard construction methods are normally sufficient to reduce noise levels within residential units to 45 dBA DNL. Where exterior noise levels range from 60 to 65 dBA DNL, the inclusion of adequate forced air mechanical ventilation is often the method selected to reduce interior noise levels to acceptable levels by closing the windows to control noise. Where noise levels exceed 65 dBA DNL, forced-air mechanical ventilation systems and sound-rated construction methods are normally required. Such methods or materials may include a combination of smaller window and door sizes as a percentage of the total building façade facing the noise source, sound-rated windows and doors, sound rated exterior wall assemblies, and mechanical ventilation so windows may be kept closed at the occupants discretion. Where the exterior noise environment does not exceed 75 dBA DNL, attaining the necessary noise reduction from exterior to interior spaces is readily achievable with proper wall construction techniques, the selections of proper windows and doors, and the incorporation of forced-air mechanical ventilation systems to allow occupants to control noise by closing the windows.

Noise sensitive land uses adjacent to the railroad would be exposed high maximum instantaneous noise when railroad train warning whistles are sounded. Normally, train warning whistles are sounded several times within approximately one-quarter mile of an "at-grade crossing", when entering or leaving a station, or when there are obstructions or persons near the track. The increase in development density in the CVSP Plan Area would increase the likelihood of train warning whistles being sounded. Noise sensitive land uses proposed in the vicinity of the UPRR would likely require forced-air mechanical ventilation systems and sound-rated construction methods to reduce interior average and maximum noise levels to acceptable levels per General Plan Policies 1 and 12. In the vicinity of "at-grade" railroad crossings or the proposed Caltrain Station, high-performance noise insulation features such as stucco-sided staggered-stud or double-stud walls and sound rated windows and doors may be required to maintain interior maximum instantaneous noise levels below 50 dBA in bedrooms and 55 dBA in other rooms. As the distance between the at-grade crossings and the receivers increase, the noise insulation requirements necessary to achieve acceptable levels decreases.

Mitigation Measures:

The following mitigation measures would reduce the potentially significant impacts to a less-than-significant level:

- Maintain a sufficient buffer distance between transportation noise sources and future sensitive land uses, or alternatively, construct noise barriers or create acoustically shielded outdoor use areas utilizing buildings to achieve noise exposures of 60 dBA DNL or less. The specific determination of necessary mitigation measures shall occur during project level environmental review and design. Results of the analysis shall be submitted to the City prior to issuance of a building permit.

- Retain a qualified Acoustical Specialist to prepare for City review and approval a detailed acoustical analysis of interior noise reduction requirements and specifications for all projects proposed within the 60 dBA DNL contours of area roadways, in accordance with State and City standards. Interior noise levels must be maintained at or below 45 dBA DNL. Building sound insulation requirements shall include forced air mechanical ventilation in noise environments exceeding 60 dBA DNL. Special building construction techniques (e.g., sound-rated windows and building facade treatments) may be required where exterior noise levels exceed 65 dBA DNL. These treatments include, but are not limited to, sound rated windows and doors, sound rated exterior wall assemblies, and acoustical caulking. The specific determination of required treatments shall be made on a unit-by-unit basis during project design. Results of the analysis, including the description of the necessary noise control treatments, shall be submitted to the City along with the building plans prior to issuance of a building permit.

- Retain a qualified Acoustical Specialist to prepare for City review and approval a detailed acoustical analysis of interior noise reduction requirements and specifications for all noise-sensitive projects proposed within 900 feet of the UPRR, in accordance with State and City standards. Building sound insulation requirements shall include forced air mechanical ventilation in noise environments exceeding 60 dBA DNL. Special building construction techniques (e.g., sound-rated windows and building facade treatments) may be required to maintain interior maximum instantaneous noise levels to 50 dBA L_{max} in bedrooms and 55 dBA L_{max} in other habitable rooms. These treatments include, but are not limited to, sound rated windows and doors, sound rated exterior wall assemblies, and acoustical caulking. The specific determination of required treatments shall be made on a unit-by-unit basis during project design. Results of the analysis, including the description of the necessary noise control treatments, shall be submitted to the City along with the building plans prior to issuance of a building permit.

Impact 2: Generation of Excessive Noise Levels.
Activities and processes facilitated by the Coyote Valley Specific Plan could generate noise levels in excess of established noise thresholds. **This is a potentially significant noise impact.**

Land uses including industrial, office and commercial, parks, educational facilities, and fire stations are located throughout the plan area and are adjoined by existing or proposed noise-sensitive uses. Noise and land use compatibility conflicts between noise-generating uses and noise-sensitive uses could occur if project-level noise analyses are not made during the planning phase of projects.

Office, Commercial, and Industrial Uses

Office, commercial, or industrial land uses proposed within the plan area could generate noise as a result of the operation of noise sources such as loading docks, heating, ventilation, and cooling equipment, other mechanical equipment such as emergency back-up generators and trash compactors, parking lots, and other project specific sources of noise (e.g., operational noise from a auto body shop, etc.). Noise levels exceeding City standards (55 dBA DNL) could be anticipated at adjacent noise-sensitive receivers depending upon the configuration of the final land use plan at parcels designated for office, commercial, and industrial development.

Parks and Educational Facilities

The CVSP includes the development of parks and ball fields in areas adjacent to proposed educational facilities and proposed residential land uses. Two parks and ball fields are also proposed just north of Palm Avenue in the vicinity of the existing residential land uses located in the CVSP greenbelt area. Nine elementary schools, two middle schools and one high school would be developed with the CVSP area. A satellite community college campus may also be developed within the plan area. It is anticipated that each of these educational facilities would use the adjacent parks and ball fields for recreational activities.

The playfields proposed as part of the CVSP would generate noise from players, spectators, and potentially, public address systems. Some of the playfields would include lighting and, therefore, could be expected to generate noise in the late evening hours. Passive public parks could contain one or more of the following amenities that are part of most neighborhood parks: tot lot/playground, open turf area, picnic tables with barbeques, pathways, etc. It is not anticipated, given the activities outlined above, that noise from passive parks would cause any adverse noise impacts upon either existing or future noise sensitive receptors in the area. Active parks, ball fields, or sports complexes could be a potentially significant source of community noise. Maximum noise levels from such uses can exceed 80 dBA L_{max} at a distance of approximately 150 feet and day-night average noise levels generated by these parks or sports complexes could exceed 55 dBA DNL at the property line. Noise generated by such active parks could exceed City standards, thereby requiring further study.

Fire Stations

The proposed project includes the construction of three fire stations; one on Bailey Avenue in the north, one along Fisher Creek Drive near Palm Canyon, and one near Coyote Creek Road north of Scheller Avenue. Noise-generating activities associated with the operation of a fire station include sirens sounding as vehicles leave the station, the testing of engines, horns, and sirens during the morning check, weekly testing of the emergency generator, and minimal training exercises. Noise measurements conducted at fire stations during the morning equipment checkout indicate that maximum noise levels at a distance of 50 feet from an activity can reach 80 to 85 dBA L_{max}. Typically, such activities are within the range of vehicular traffic noise when stations are located adjacent to major streets. Normally, an emergency generator is tested weekly. Proper siting and shielding of this equipment would result in noise levels consistent with the San José Emergency Generator Ordinance.

Mitigation Measure:

The following mitigation measures would reduce the potentially significant impacts to a less-than-significant level:

- Non-residential development shall comply with Policy 11 of the Noise Element and not exceed 55 dBA DNL at existing or planned residential properties in the vicinity. For office, commercial, industrial developments and fire stations, site planning can effectively mitigate noise impacts; such as by not locating loading docks near residences. Equipment screens, fan silencers, and engine mufflers shall be used to mitigate noise from mechanical equipment. Noise barriers shall be used to control noise from parking and vehicle circulation. For recreational uses, proposed development must consider impacts upon the adjacent residential development in terms of the location of active sports areas, their orientation on the site, whether or not lights are included, and speech amplification systems. The proper application of these measures individually or together would mitigate this potentially significant impact to a less-than-significant level.

Impact 3: Groundborne Vibration.
The proposed project would locate vibration-sensitive receivers adjacent to the Union Pacific Railroad. Railroad trains traveling along the railroad could expose persons to excessive groundborne vibration. **This is a potentially significant impact.**

Residential land uses are proposed on parcels adjoining the Union Pacific Railroad. Freight and passenger trains along the UPRR are a source of ground borne vibration. Caltrain, Amtrak, and unscheduled UPRR freight trains pass through the CVSP Plan Area each day. The total number of trains passing the site is anticipated to be greater than 30 events per day but less than 70 events per day, therefore the "occasional" compatibility threshold of 75 VdB is used in the evaluation of residential uses with respect to vibration compatibility. Based on the results of the vibration measurements made as part of this study, the calculated 75 VdB contour distance is 150 feet from the center of the railroad track. Residential units planned within 150 feet of the center of the railroad track could be exposed to vibration levels greater than the 75 VdB. Sensitive industries (e.g., research and development facilities) proposed in the vicinity of the railroad could be affected by lower vibration levels resulting from railroad trains. Oftentimes, such uses have equipment such as precision microscopes that can be affected by lower vibration levels. Vibration sensitive manufacturing or research should always require detailed evaluation to define the acceptable vibration levels.

Mitigation Measures:

The following mitigation measures shall be included in the CVSP to reduce the impact to a less-than-significant level:

- The most effective option is to locate structures far enough away from the rail lines. When refining the plan, minimize the number of residential units within 150 feet from the center of the railroad track.

- If residential structures are proposed within 150 feet conduct site-specific vibration monitoring during subsequent design and development to confirm the allowable vibration setback. Vibration levels shall be designed so as not to exceed 75 VdB measured vertically on the ground at a residential building site, consistent with Federal Transit Administration Guidelines.

- Alternatively, proper support of foundation systems for residential structures should be considered and building design should avoid resonant frequencies that coincide with primary frequencies of train-generated ground vibration (10 Hz and 20 Hz). Vibration isolation of buildings has been recently considered for residential applications.

- Resilient support of the railroad tracks using ballast mats or a shredded tire underlay can be implemented to reduce vibration levels by 3 to 4 VdB. This measure would require coordination with the rail company.

Impact 4: Project-Generated Traffic Noise.
Traffic volume increases in San Jose and Morgan Hill, outside of the plan area, will result with the development of the Coyote Valley Specific Plan. Increased traffic volumes will generate an increase in traffic noise along the local roadway network. In some locations, these increases would be substantial. **This is a significant and unavoidable impact.**

The Coyote Valley Specific Plan vicinity contains a variety of land uses with varying sensitivities to noise. Residential land uses would be most affected by traffic noise level increases. Industrial land uses would not generally be affected by an increase in traffic noise. Office and commercial uses are not typically affected by traffic noise increases along the local roadway network. The noise environment would be noticeably increased over existing conditions with the implementation of the project and would affect various land uses differently.

Traffic volume information was reviewed at study area intersections outside the Coyote Valley Specific Plan area. A comparison of "Existing", "2005 Plus CVRP" (Coyote Valley Research Park), and "2005 Plus CVSP" (Coyote Valley Specific Plan) traffic volumes was made at the project study intersections, and the relative change in traffic noise along identified roadway segments was calculated. Roadway segments experiencing a traffic noise level increase less than 3 dBA DNL were excluded from further analysis, as the noise level increase would not be substantial. Where noise levels were calculated to increase by 3 dBA DNL or more, the noise level increase was considered substantial. Tables 9 and 10 show the roadway links that are calculated to experience a substantial noise increase (3 dBA or more) as a result of the project. The relative difference in traffic noise increases expected with the development of the Coyote Valley Research Park and the Coyote Valley Specific Plan are also presented.

City of San Jose

The project would generate increased vehicular traffic along the local roadway network serving the plan area. Substantial noise level increases would occur at noise sensitive receivers along identified roadway segments of Monterey Road, Santa Teresa Road, Bernal Road, McKean Road, and Harry Road as a result of the project (Table 10). Noise level increases that would be considered substantial would range from 3 dBA DNL to 6 dBA DNL over existing noise conditions. Coyote Valley Specific Plan traffic noise level increases would be within 0 to 1 decibel of the traffic noise level increases expected under background traffic conditions.

City of Morgan Hill

Substantial noise level increases would result at noise sensitive receivers along identified roadway segments of Monterey Road, Tilton Avenue, Cochrane Road, and Butterfield Boulevard (Table 11). Project-generated traffic noise levels would be about 3 dBA DNL to 5 dBA DNL higher than existing noise conditions and the noise environment at affected noise-sensitive receivers would be permanently increased. Coyote Valley Specific Plan traffic noise level increases would be within 0 to 2 decibels of the traffic noise level increases expected with the development of the Coyote Valley Research Park.

Greenbelt Area

Traffic noise levels in the Greenbelt Area of CVSP are anticipated to increase along the primary thoroughfares including Monterey Road, Santa Teresa Boulevard, Dougherty Avenue and Palm Avenue. Noise levels along Kalana Avenue, San Bruno Avenue, Miramonte Avenue, Live Oak Avenue, and Madrone are not expected to increase substantially as a result of the project. The noise environment at portions of the Greenbelt Area would change, however, as the CVSP area develops from a "semi-rural" setting to a more suburban area. Traffic and sounds associated with more densely developed properties would be more prevalent throughout the Greenbelt Area.

Mitigation Measures:

Methods available to mitigate project generated noise level increases would need to be studied on a case-by-case basis at receivers that would be considered noise impacted. Noise reduction methods could include the following:

- New or larger noise barriers or other noise reduction techniques could be constructed to protect existing residential land uses where reasonable and feasible. The feasibility of providing mitigation at affected noise-sensitive receivers could be determined by detailed study of the affected roadway segments.

- Alternative noise reduction techniques could be implemented, such as re-paving the streets with "quieter" pavement types such as Open-Grade Rubberized Asphaltic Concrete. The use of "quiet" pavement can reduce noise levels by 2 to 5 dBA depending on the existing pavement type and condition, traffic speed, traffic volumes, and other factors.

- Installing traffic calming measures to slow traffic.

- Affected residences could be provided building sound insulation such as sound rated windows and doors on a case-by-case basis as a method of reducing noise levels in interior spaces.

Given the scope of the project and expected noise level increases resulting from project traffic, it may not be reasonable or feasible to reduce project-generated traffic noise at all affected receivers. The increase in development density would increase noise levels noticeably at receivers. Measures available to reduce the noise level increases would not likely be reasonable or feasible in all areas, therefore, the impact would be considered significant and unavoidable.

TABLE 10 Traffic Noise Level Increases Above Existing Noise Levels (DNL, dBA)

City of San Jose		Noise Increase (DNL) Above Existing Noise Levels		CVRP vs. CVSP
Road Segment	**Vicinity**	**2005 CVRP**	**2005 CVSP**	**Difference**
Monterey Road	Monterey Plaza to Ford Road	2	3	+1
	Ford Road to Flintwell Way	2	3	+1
	Flintwell Way to Bernal Road	2	3	+1
	Bernal Road to Menard Drive	4	5	+1
	Menard to CVSP Area	5	6	+1
Santa Teresa Road	Cottle Road to Encinal Drive	2	3	+1
	Encinal Drive to Miyuki Drive	3	3	0
	Miyuki Drive to San Ignacio Avenue	3	3	0
	San Ignacio Avenue to Great Oaks Boulevard	4	5	+1
	Great Oaks Boulevard to Martinvale Lane	5	5	0
	Martinvale Lane to Bernal Road	3	4	+1
	Bernal Road to Chantilly Lane	4	4	0
	Chantilly Lane to Avenida Espana	4	4	0
	Avenida Espana to Cheltenham Way	6	6	0
	Cheltenham Way to Bayliss Drive	6	6	0
	Bayliss Drive to CVSP	6	6	0
Bernal Road	Via Del Oro to San Ignacio Avenue	4	4	0
	San Ignacio to Monterey Road	3	3	0
McKean Road	Harry Road to Bailey Avenue	3	4	+1
Harry Road	McKean Road to Almaden Expressway	2	3	+1

TABLE 11 Traffic Noise Level Increases Above Existing Noise Levels (DNL, dB)

City of Morgan Hill		Noise Increase (DNL) Above Existing Noise Levels		CVRP vs. CVSP
Road Segment	**Vicinity**	**2005 CVRP**	**2005 CVSP**	**Difference**
Monterey Road	Kirby Avenue to Tilton Avenue	3	5	+2
	Tilton Avenue to Burnett Avenue	2	4	+1
	Burnett Avenue to Peebles Avenue	2	3	+1
	Peebles Avenue to Madrone Parkway	2	3	+1
	Madrone Parkway to Cochrane Road	2	3	+1
Tilton Avenue	Hale Avenue to Dougherty Avenue	3	3	0
	Dougherty Avenue to Monterey Road	3	3	0
Cochrane Road	Monterey Road to Butterfield Boulevard	2	3	+1
Butterfield Boulevard	Cochrane Road to Sutter Boulevard	2	4	+2

Impact 5: McKean Road to Almaden Expressway.
Traffic noise levels generated along McKean Road would be substantially increased with the development of the Coyote Valley Specific Plan. **This is a potentially significant impact.**

McKean Road will be widened to four lanes, two in each direction, between Almaden Expressway and Bailey Road. The roadway would be realigned in some locations along this segment. Realignment would occur north of Hacienda School to provide a direct connection to Almaden Expressway and along McKean Road just west of Timothy Lane to eliminate a sharp turn in the existing roadway alignment.

A screening level analysis was conducted to determine potential noise level increases that would result from proposed roadway improvements. Future traffic volumes are expected to yield increased noise levels of about 4 to 5 dBA at residential receivers along the corridor. Noise level increases could be higher in some areas where receivers are not currently located adjacent to McKean Road. The realignment of the roadway closer to these receivers would result in larger noise level increases. Table 12 summarizes the results of noise contour distance calculations for McKean Road.

TABLE 12 Existing and Future Noise Contour Distances for McKean Road to Almaden Expressway

	Distance from Roadway Center (feet)		
Roadway Segment	**70 DNL[5]**	**65 DNL**	**60 DNL**
Existing Conditions	--	80	190
2005 plus CVSP	80	185	400

Mitigation Measures:

Similar to Impact 4, methods available to mitigate project generated noise level increases would need to be studied on a case-by-case basis during environmental review of this project. Noise reduction methods could include new or larger noise barriers, building sound insulation treatments, the use of "quieter" pavement, or the installation of traffic calming measures.

Impact 6: **Construction Noise.** Existing and proposed noise-sensitive land uses would be exposed to construction noise levels in excess of the significance thresholds for a period of more than one construction season. **This is a significant and unavoidable impact.**

Future construction within the plan area would generate noise, and would temporarily increase noise levels at adjacent land uses. The build out of the CVSP would affect the noise environment at existing single-family residential neighborhoods and individual homes within the Development Area, primarily in the southeastern portion of the area, and in the Greenbelt, to the south of Palm Avenue. Construction noise would increase noise levels at existing noise-sensitive land uses that would remain with the project as well as noise-sensitive land uses that would be developed with the project as later phases are developed.

Noise impacts resulting from construction depend on the noise generated by various pieces of construction equipment, the timing and duration of noise generating activities, and the distance between construction noise sources and noise sensitive receptors. Construction noise impacts primarily occur when construction activities occur during noise-sensitive times of the day (early morning, evening, or nighttime hours), the construction occurs in areas immediately adjoining noise sensitive land uses, or when construction noise lasts over extended periods of time. Where noise from construction activities exceeds 60 dBA L_{eq} and exceeds the ambient noise environment by at least 5 dBA L_{eq} at noise-sensitive uses in the project vicinity for a duration of one year or more, the impact would be considered significant.

[5] Data not reported within 50 feet of the roadway center.

Construction activities generate considerable amounts of noise. Construction-related noise levels are normally highest during the demolition phase and during the construction of project infrastructure. The demolition and infrastructure phases of construction require heavy equipment that generates the highest noise levels. Typical hourly average construction generated noise levels are about 81 dBA to 88 dBA measured at a distance of 50 feet from the center of the site during busy construction periods (e.g., earth moving equipment, impact tools, etc.). The highest maximum noise levels generated by project construction would typically range from about 90 to 98 dBA at a distance of 50 feet from the noise source. Construction-related noise levels are normally less during building framing, finishing, and landscaping phases. There would be variations in construction noise levels on a day-to-day basis depending on the specific activities occurring at the site.

Construction noises are disturbances that are necessary for the construction or repair of buildings and structures in urban areas. Reasonable regulation of the hours of construction, as well as regulation of the arrival and operation of heavy equipment and the delivery of construction materials, are necessary to protect the health and safety of persons, promote the general welfare of the community, and maintain the quality of life. Limiting the hours when construction can occur to daytime hours is often a simple method to reduce the potential for noise impacts. In areas immediately adjacent to construction, controls such as constructing temporary noise barriers and utilizing "quiet" construction equipment can also reduce the potential for noise impacts.

The build out of the plan area would increase the ambient noise environment at existing homes within the Development Area and in the Greenbelt, as well as residential units built within the plan area during the earlier construction phases. Construction noise levels are anticipated to exceed 60 dBA L_{eq} and the ambient by 5 dBA or more over extended periods of time. It is conceivable that the phasing of projects would be such that a particular receiver or group of receivers would be subject to construction noise levels in excess of 60 dBA L_{eq} and the ambient by 5 dBA for durations exceeding one year. The construction of projects implemented by the CVSP would result in a significant temporary noise level increase at neighboring noise-sensitive properties.

Mitigation Measures:

The following available controls should be included in the project to reduce construction noise levels as low as practical.

- Noise-generating activities at the construction site or in areas adjacent to the construction site associated with the project in any way should be restricted to the hours of 7:00 a.m. to 6:00 p.m., Monday through Friday, and 8:00 a.m. to 5:00 p.m. on Saturdays. No construction activities should occur Sundays or holidays.

- Equip all internal combustion engine driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.

- Locate stationary noise generating equipment (e.g., portable concrete crusher) as far as possible from sensitive receptors.

- Utilize "quiet" air compressors and other stationery noise sources where technology exists.

- The contractor shall prepare a detailed construction plan identifying the schedule for major noise-generating construction activities. The construction plan shall identify a procedure for coordination with the adjacent noise sensitive facilities so that construction activities can be scheduled to minimize noise disturbance.

- Designate a "disturbance coordinator" who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator will determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and will require that reasonable measures warranted to correct the problem be implemented. Conspicuously post a telephone number for the disturbance coordinator at the construction site and include it in the notice sent to neighbors regarding the construction schedule.

The following additional controls would be required if pile driving is used during the construction of building foundations:

- Multiple-pile drivers shall be considered to expedite construction. Although noise levels generated by multiple pile drivers would be higher than the noise generated by a single pile driver, the total duration of pile driving activities would be reduced.

- Temporary noise control blanket barriers shall shroud pile drivers or be erected in a manner to shield adjacent noise-sensitive land uses. Such noise control blanket barriers can be rented and quickly erected to shield noise generating equipment or receivers.

- Foundation pile holes shall be pre-drilled to minimize the number of impacts required to seat the pile. Pre-drilling foundation pile holes are a standard construction noise control technique. Pre-drilling reduces the number of blows required to seat the pile.

Although the above measures would reduce noise generated by the construction of the project, the impact would remain significant and unavoidable as a result of the extended period of time that receivers would be exposed to construction noise.

Impact 7: Aircraft Noise.
The project would not locate noise-sensitive residential land uses within the Mineta San Jose International Airport's 60 or 65 CNEL noise contour. The project site is also located outside of the South County Airport's 60 or 65 CNEL noise contour. **This is a less-than-significant impact.**

Noise-sensitive land uses proposed within the CVSP would be located outside of the Mineta San Jose International and South County Airport's 60 or 65 CNEL noise contours. Aircraft noise intermittently affects the CVSP area as aircraft pass over the site. Although noise from these aircraft would contribute to the noise environment at some locations, the noise environment resulting from aircraft would be considered compatible with the proposed uses. This is a less-than-significant noise impact.

Mitigation Measure: NONE

Impact 8: Cumulative Noise Impacts.
The project would result in a cumulatively considerable noise level increase in surrounding areas. **This is significant and unavoidable impact.**

Substantial traffic noise level increases ranging from 3 to 6 dBA DNL were identified as a result of the project in Impact 4. Substantial traffic noise level increases expected in the City of San Jose, the City of Morgan Hill and in the CVSP Greenbelt Area would receive a cumulatively considerable noise level increase (1 dBA DNL or more) as a result of the project. Cumulatively considerable traffic noise level increases are expected to occur along segments of Monterey Road, Santa Teresa Road, McKean Road, and Harry Road as a result of the project. Substantial noise level increases would also result at noise sensitive receivers along Monterey Road, Cochrane Road, and Butterfield Boulevard. Coyote Valley Specific Plan traffic noise level increases would contribute 1 to 2 decibels to the overall noise level increase.

Mitigation Measure:

As described in Impact 4, methods available to mitigate cumulative noise level increases would need to be studied on a case-by-case basis. Noise reduction methods could include new or larger noise barriers, building sound insulation treatments, the use of "quiet" pavement, or the installation of traffic calming measures. It is unlikely that cumulative traffic noise increases in the surrounding communities could be mitigated in all areas. As such, the impact would remain significant and unavoidable.

APPENDIX A NOISE MEASUREMENT RESULTS

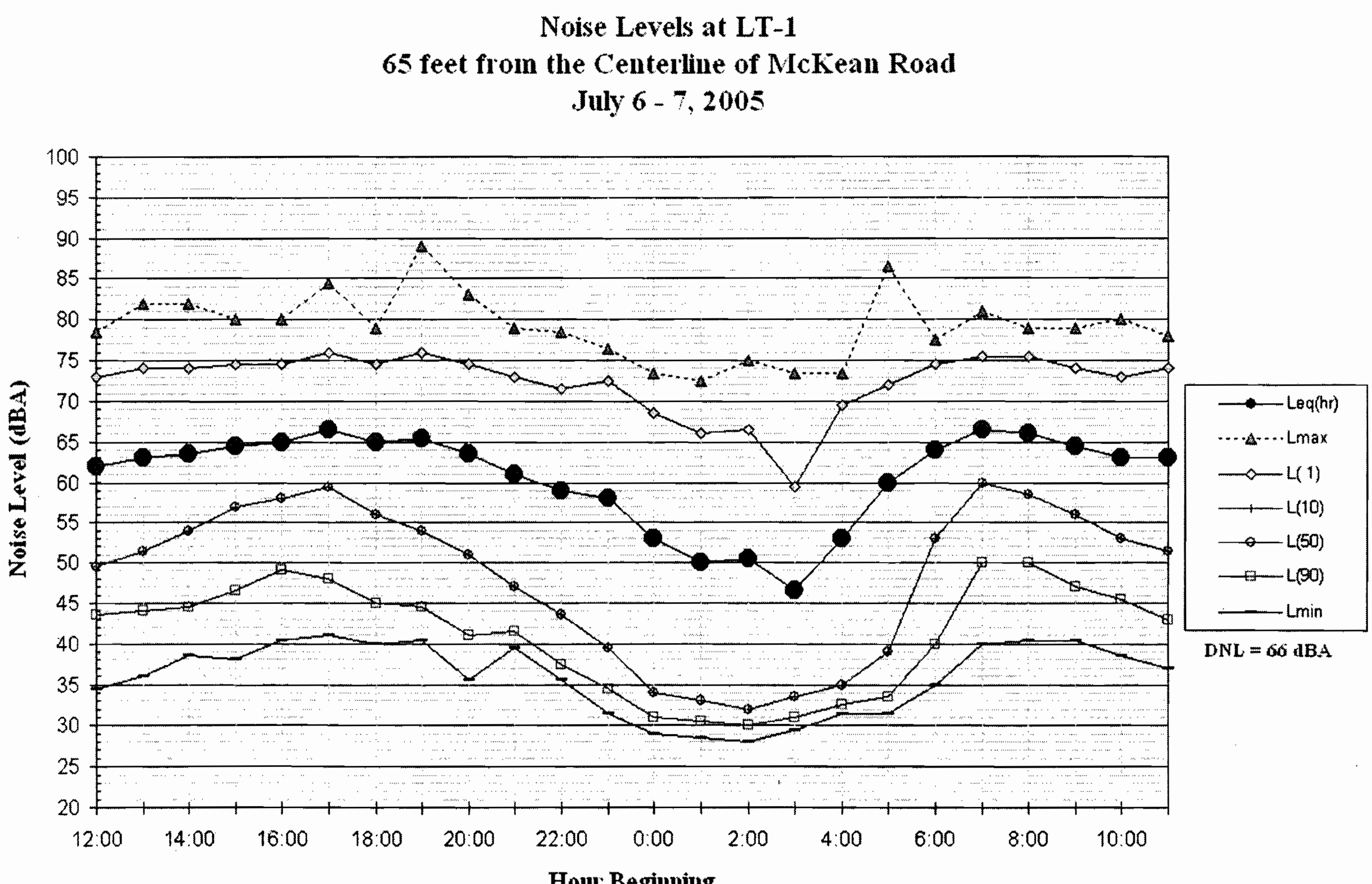
Noise Levels at LT-1
65 feet from the Centerline of McKean Road
July 6 - 7, 2005
Noise Level (dBA)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
12:00
14:00
16:00
18:00
20:00
22:00
0:00
2:00
4:00
6:00
8:00
10:00
Hour Beginning
Leq(hr)
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
DNL = 66 dBA

Figure A1

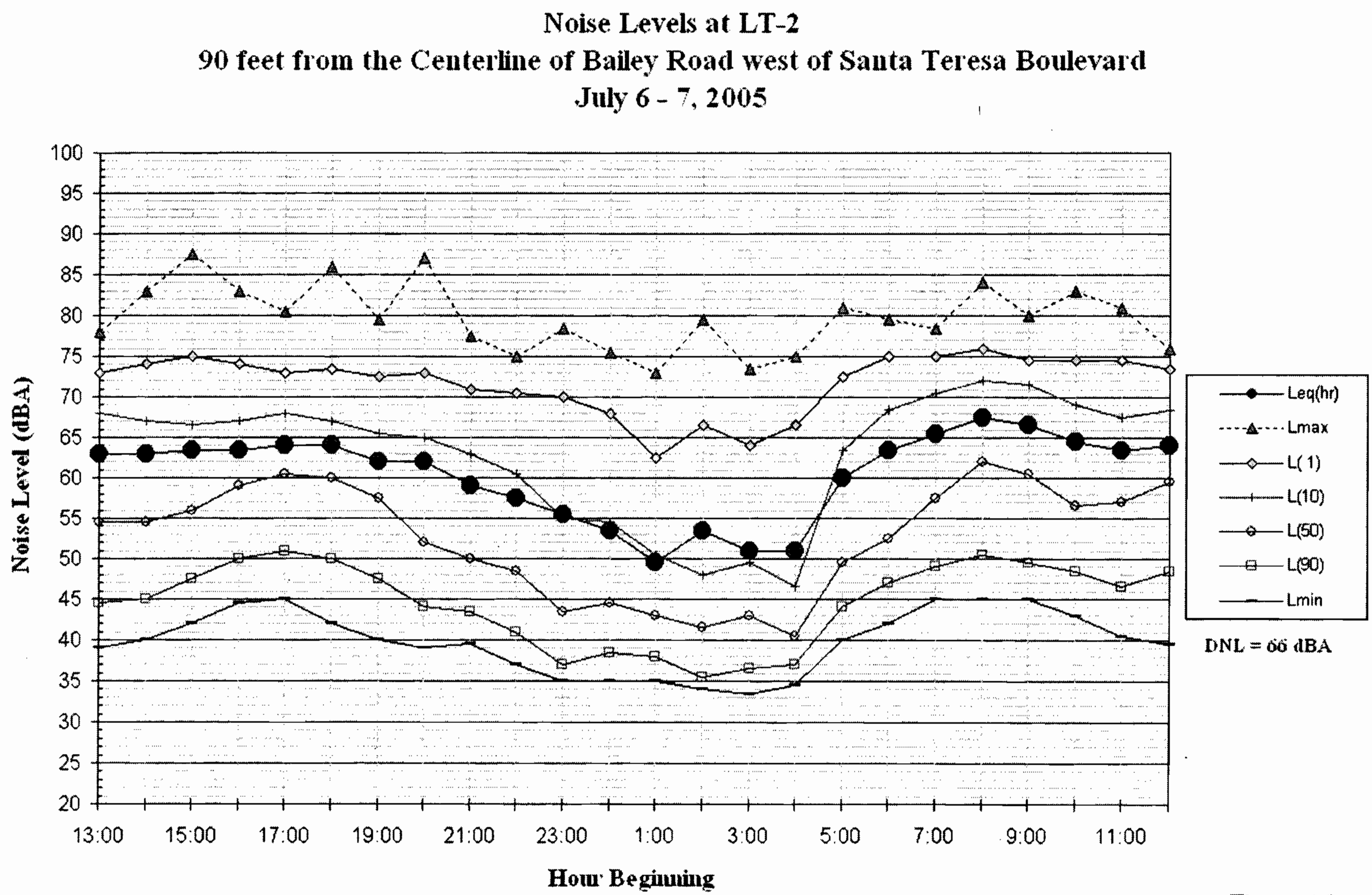
Noise Levels at LT-2
90 feet from the Centerline of Bailey Road west of Santa Teresa Boulevard
July 6 - 7, 2005
Noise Level (dBA)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
13:00
15:00
17:00
19:00
21:00
23:00
1:00
3:00
5:00
7:00
9:00
11:00
Hour Beginning
Leq(hr)
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
DNL = 66 dBA

Figure A2

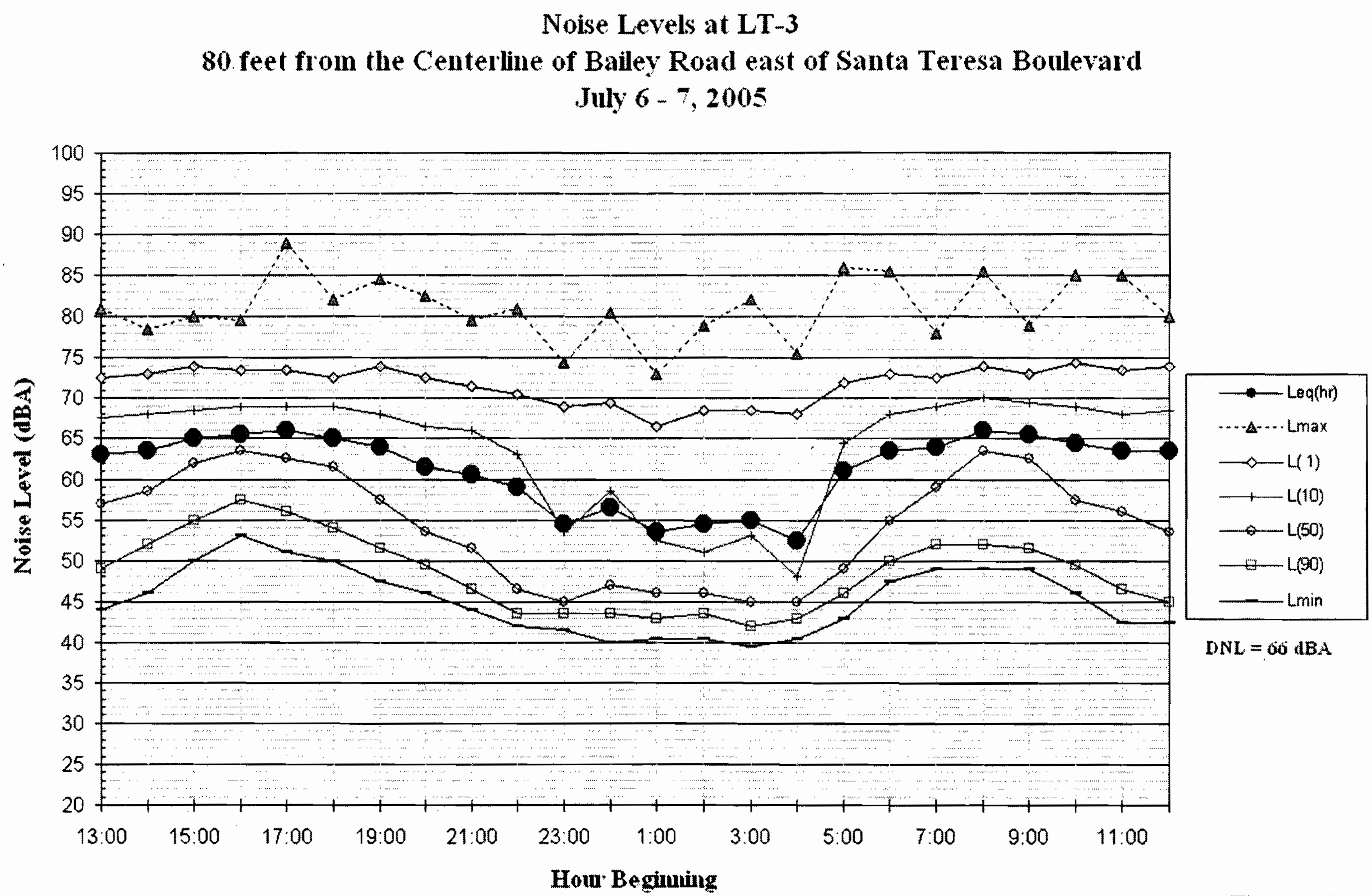
Noise Levels at LT-3
80 feet from the Centerline of Bailey Road east of Santa Teresa Boulevard
July 6 - 7, 2005
Noise Level (dBA)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
13:00
15:00
17:00
19:00
21:00
23:00
1:00
3:00
5:00
7:00
9:00
11:00
Hour Beginning
Leq(hr)
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
DNL = 66 dBA

Figure A3

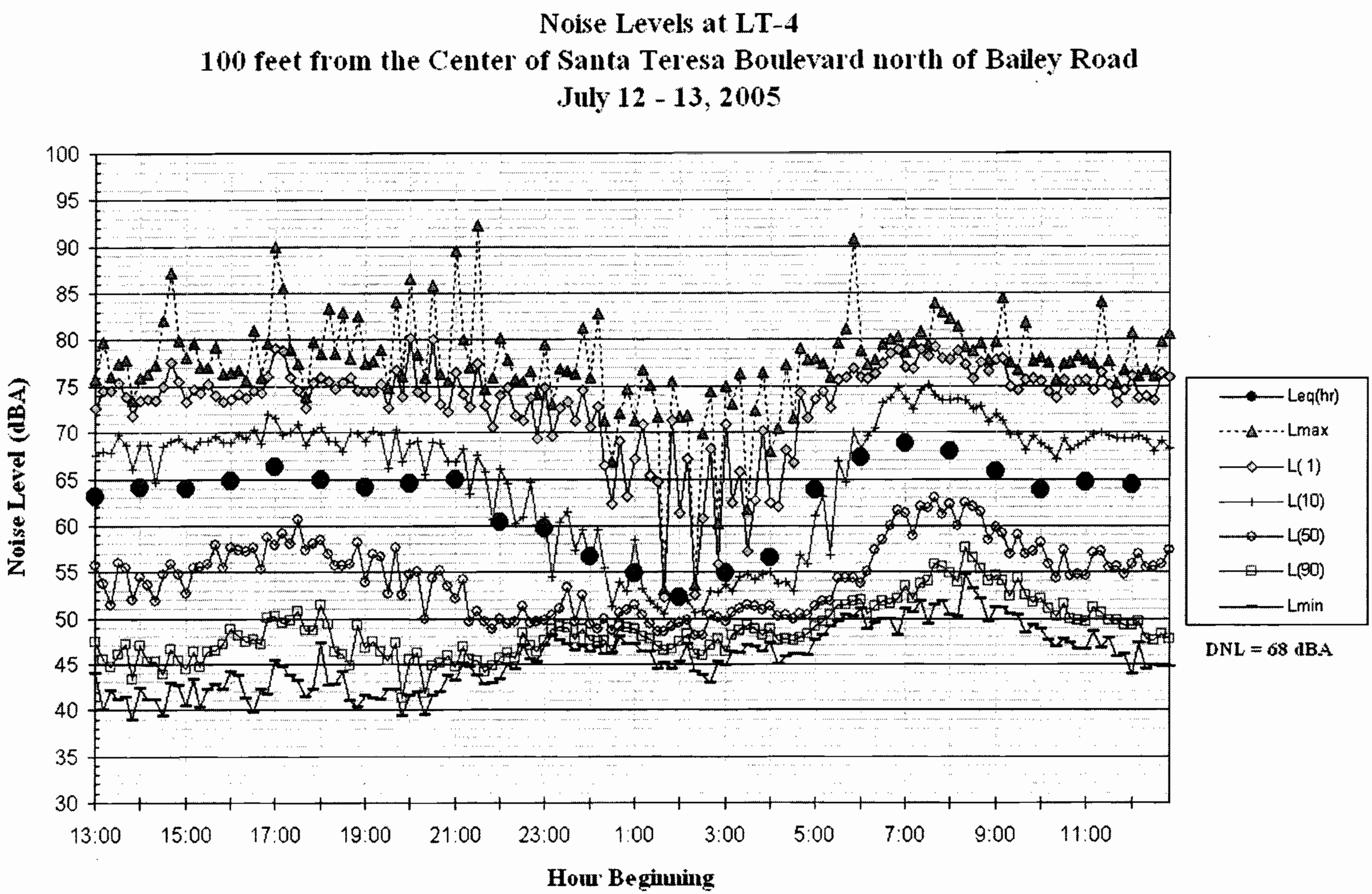
Noise Levels at LT-4
100 feet from the Center of Santa Teresa Boulevard north of Bailey Road
July 12 - 13, 2005
Noise Level (dBA)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
13:00
15:00
17:00
19:00
21:00
23:00
1:00
3:00
5:00
7:00
9:00
11:00
Hour Beginning
Leq(hr)
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
DNL = 68 dBA

Figure A4

Noise Levels at LT-4
100 feet from the Center of Santa Teresa Boulevard north of Bailey Road
July 13 - 14, 2005

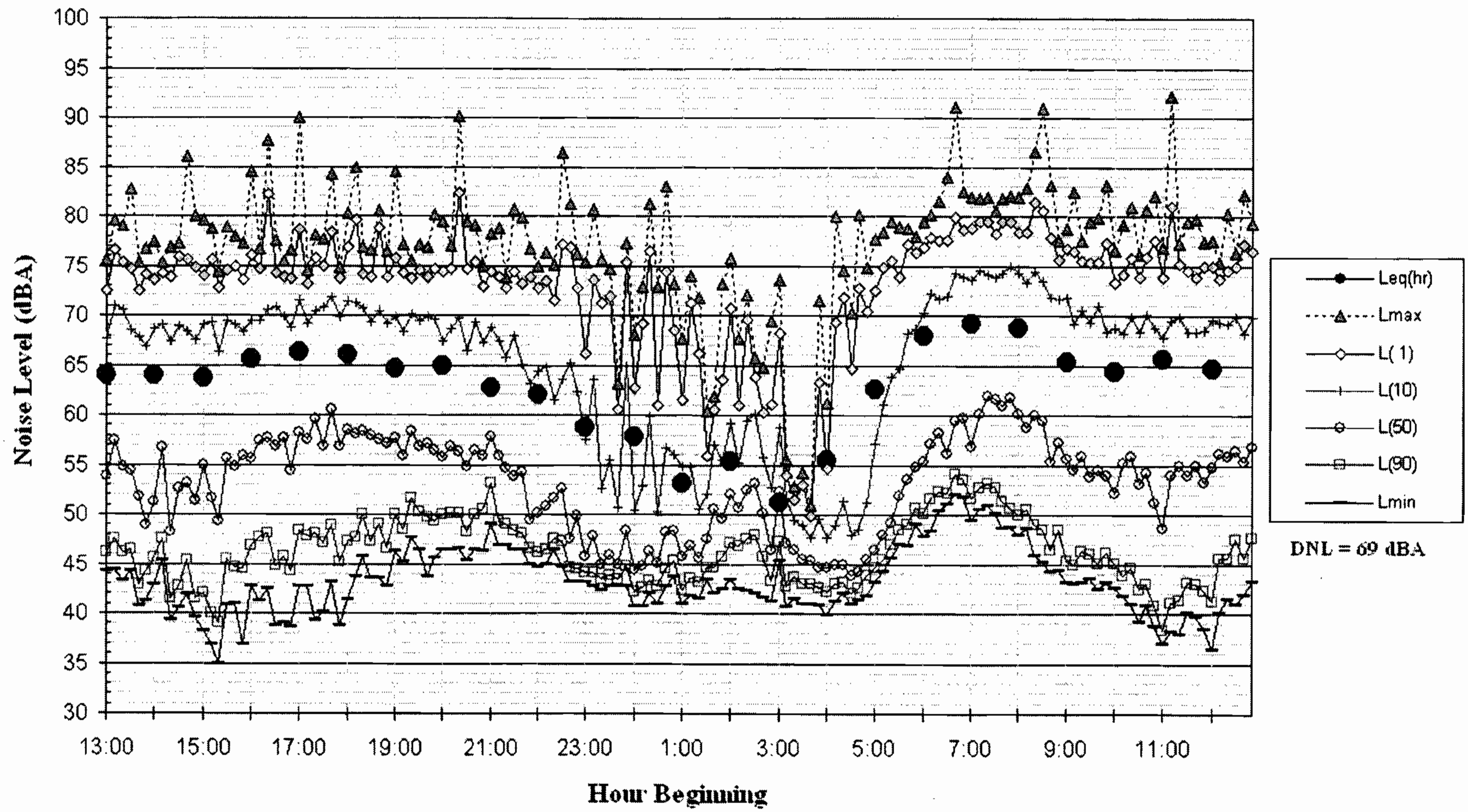

Figure A5

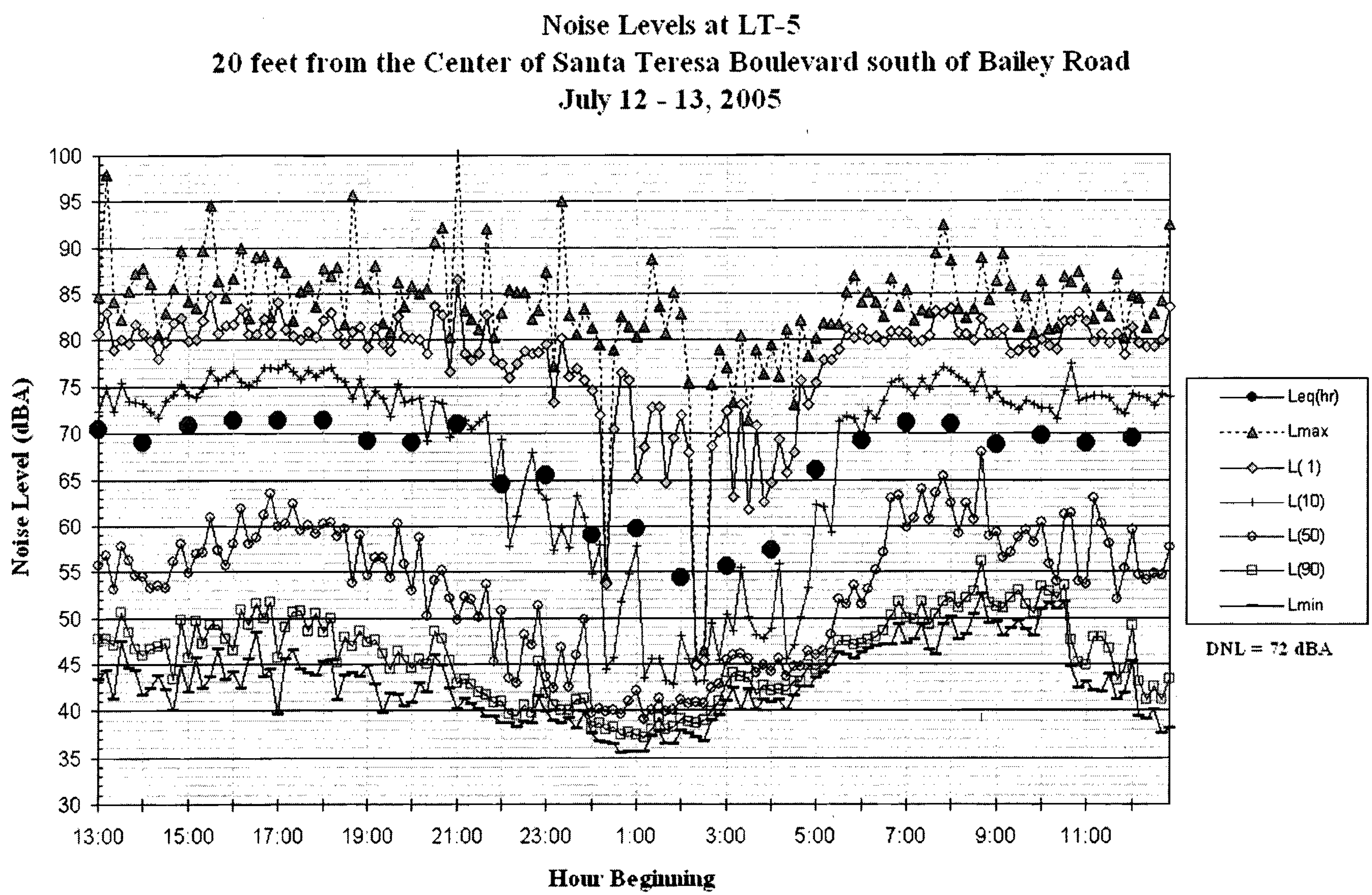
Noise Levels at LT-5
20 feet from the Center of Santa Teresa Boulevard south of Bailey Road
July 12 - 13, 2005
Noise Level (dBA)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
13:00
15:00
17:00
19:00
21:00
23:00
1:00
3:00
5:00
7:00
9:00
11:00
Hour Beginning
Leq(hr)
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
DNL = 72 dBA

Figure A6

Noise Levels at LT-5
20 feet from the Center of Santa Teresa Boulevard south of Bailey Road
July 13 - 14, 2005

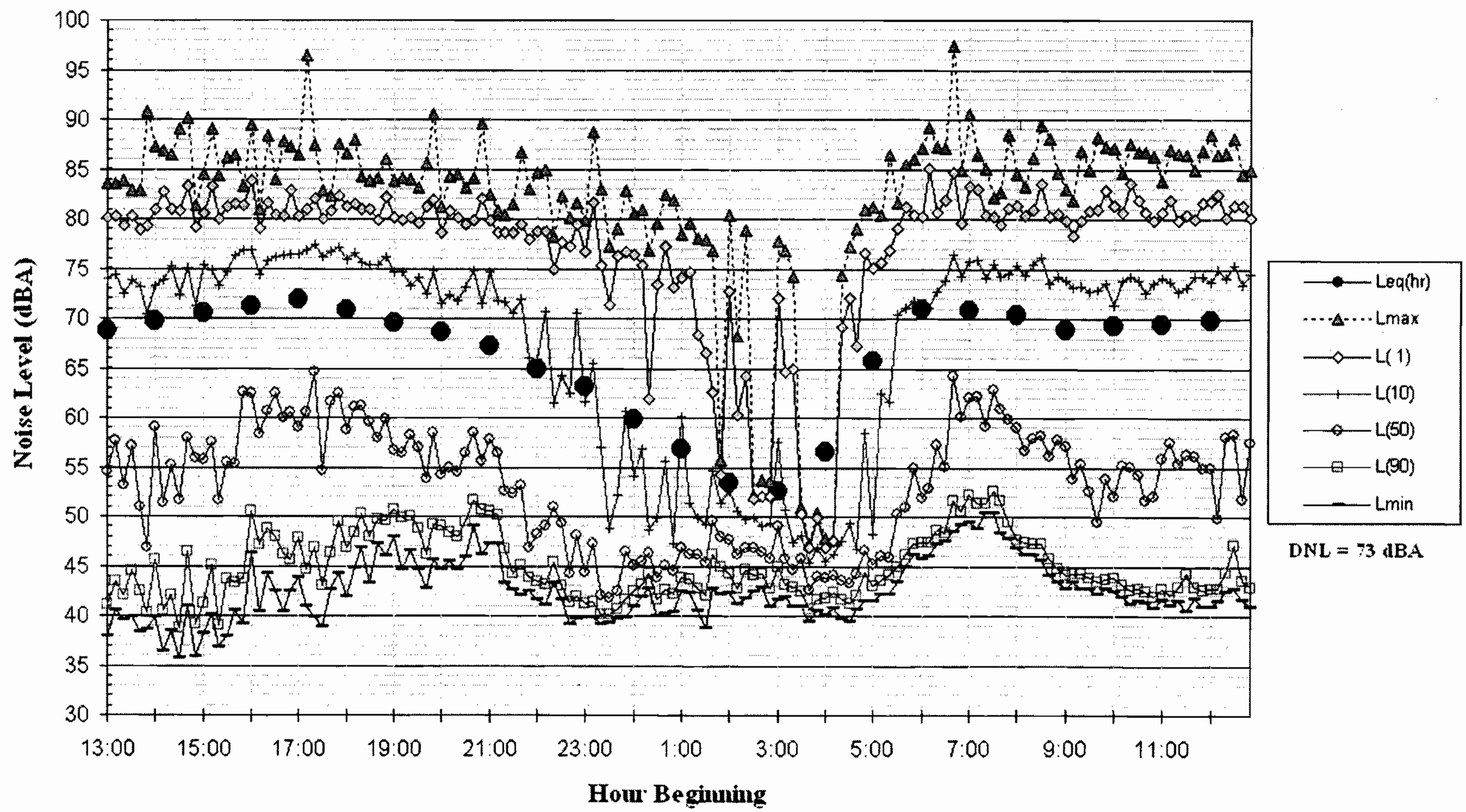

Figure A7

Noise Levels at LT-6
65 feet from the Center of Palm Avenue east of Santa Teresa Boulevard
July 12 - 13, 2005

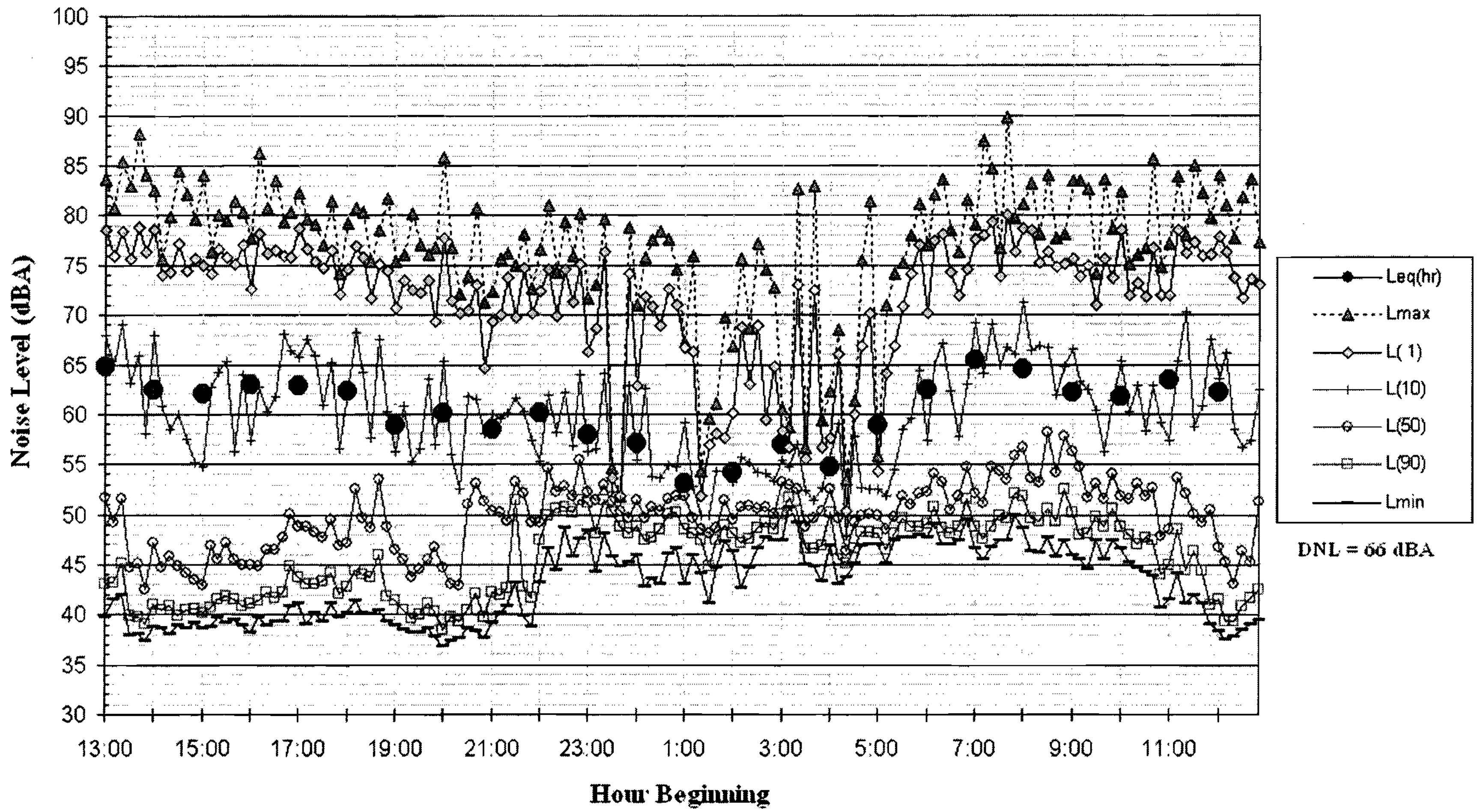

Figure A8

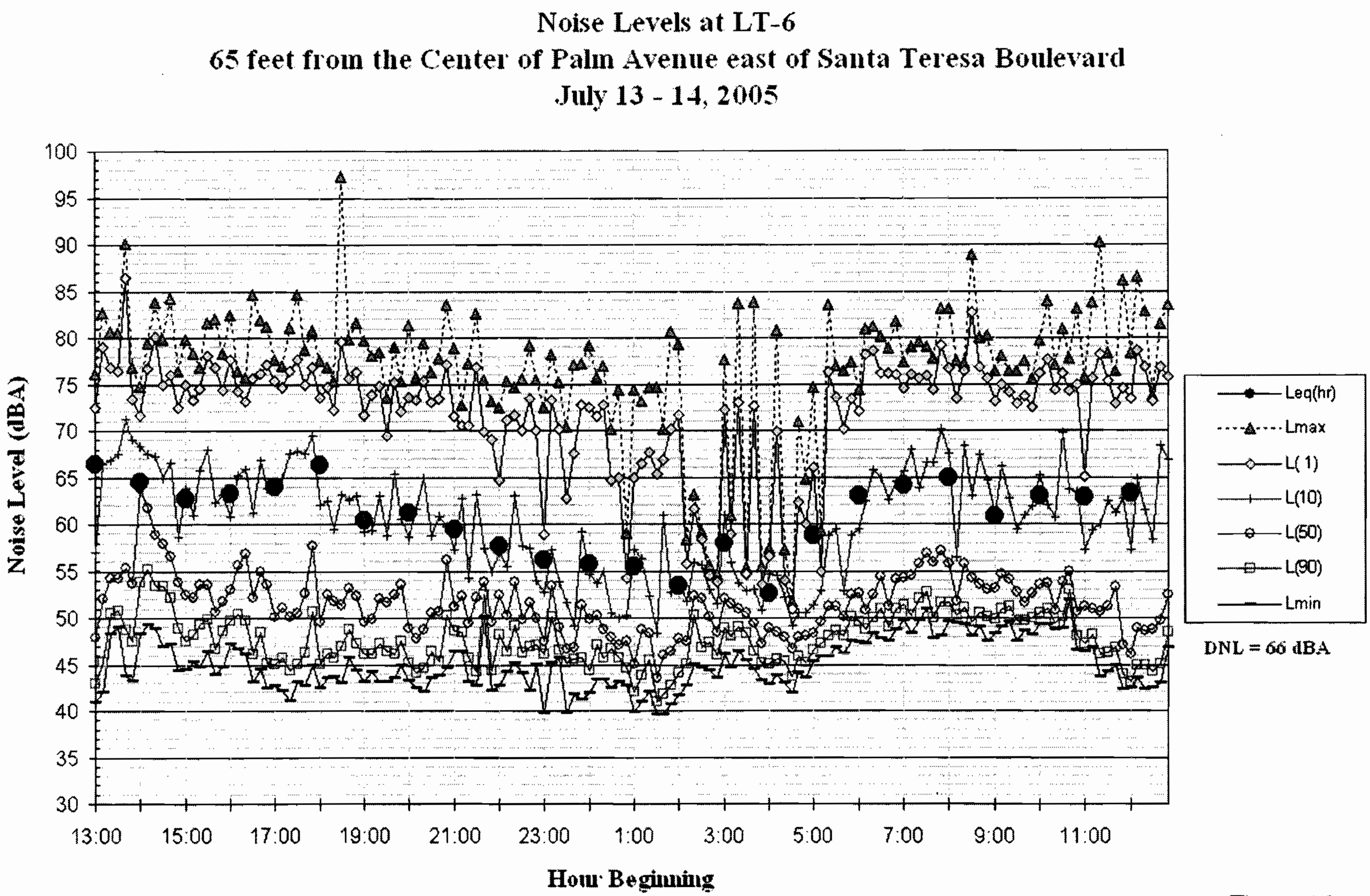
Noise Levels at LT-6
65 feet from the Center of Palm Avenue east of Santa Teresa Boulevard
July 13 - 14, 2005
Noise Level (dBA)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
13:00
15:00
17:00
19:00
21:00
23:00
1:00
3:00
5:00
7:00
9:00
11:00
Hour Beginning
Leq(hr)
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
DNL = 66 dBA

Figure A9

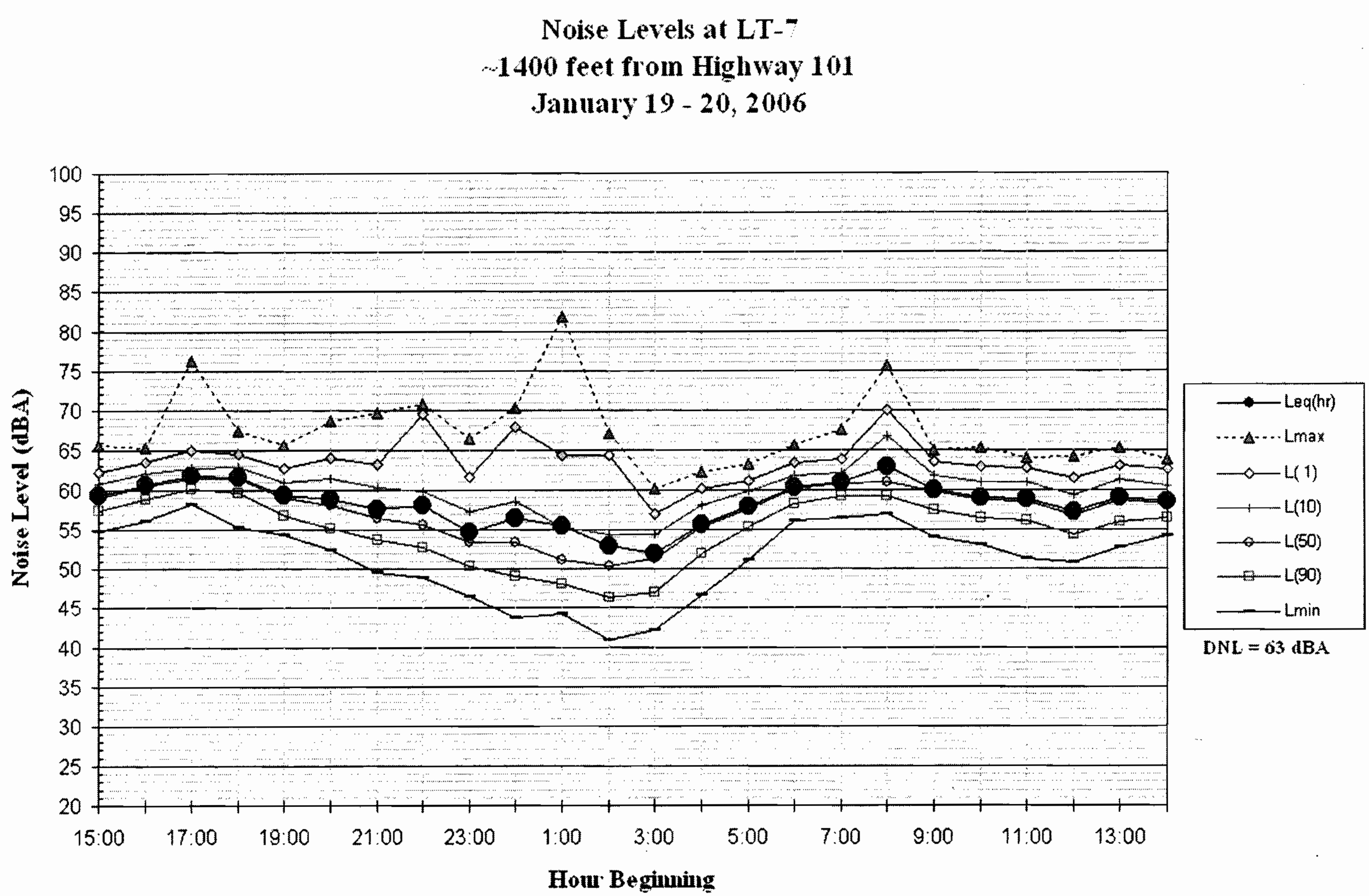
Noise Levels at LT-7
~1400 feet from Highway 101
January 19 - 20, 2006
Noise Level (dBA)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15:00
17:00
19:00
21:00
23:00
1:00
3:00
5:00
7:00
9:00
11:00
13:00
Hour Beginning
Leq(hr)
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
DNL = 63 dBA

Figure A10

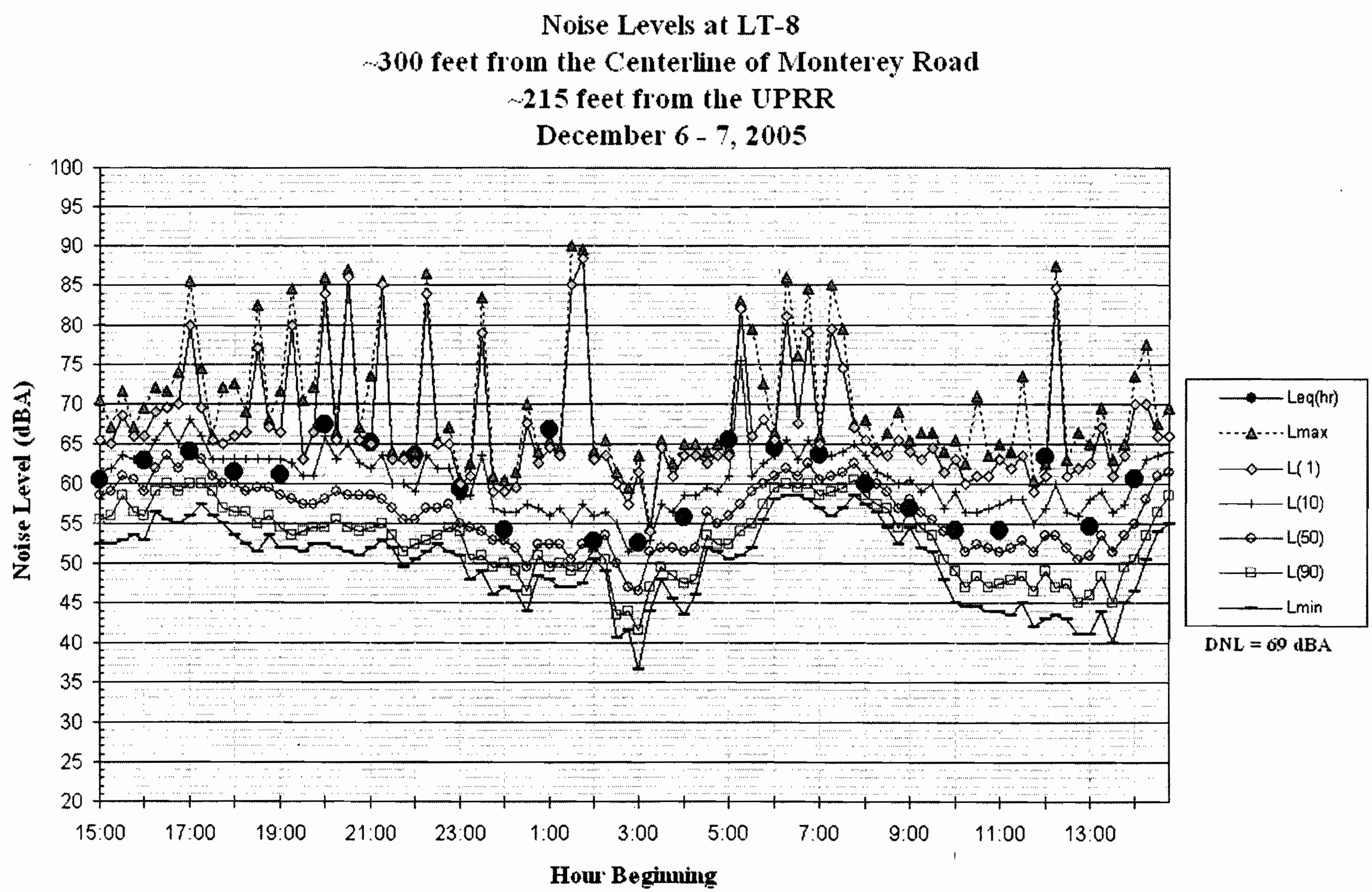
Noise Levels at LT-8
~300 feet from the Centerline of Monterey Road
~215 feet from the UPRR
December 6 - 7, 2005
Noise Level (dBA)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15:00
17:00
19:00
21:00
23:00
1:00
3:00
5:00
7:00
9:00
11:00
13:00
Hour Beginning
Leq(hr)
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
DNL = 69 dBA

Figure A11

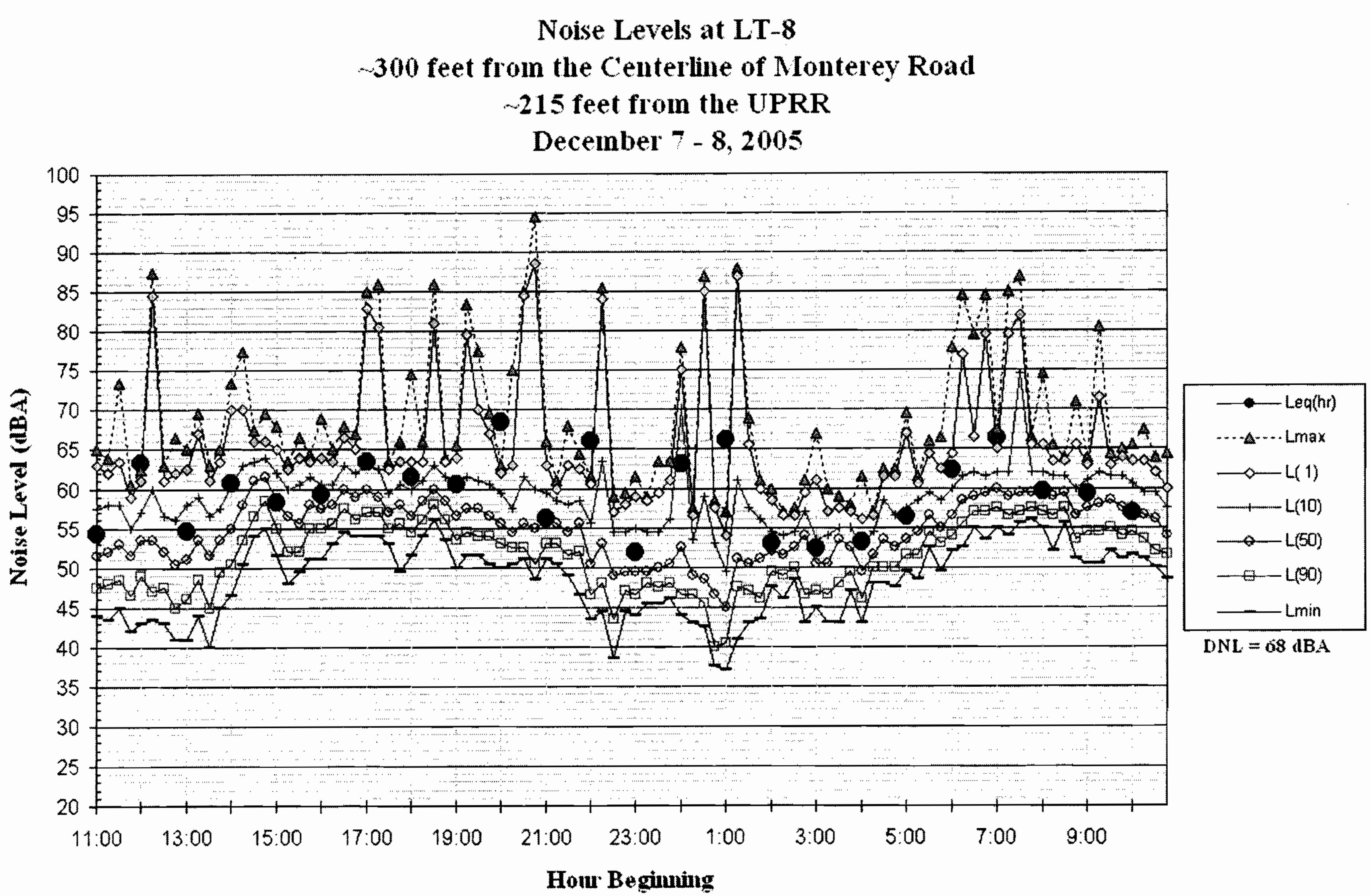
Noise Levels at LT-8
~300 feet from the Centerline of Monterey Road
~215 feet from the UPRR
December 7 - 8, 2005
Noise Level (dBA)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
11:00
13:00
15:00
17:00
19:00
21:00
23:00
1:00
3:00
5:00
7:00
9:00
Hour Beginning
Leq(hr)
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
DNL = 68 dBA

Figure A12